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FINANCE COMMERCE

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"FAR EASTERN REVIEW"

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Vol. XXV | October 1929 | No. 10

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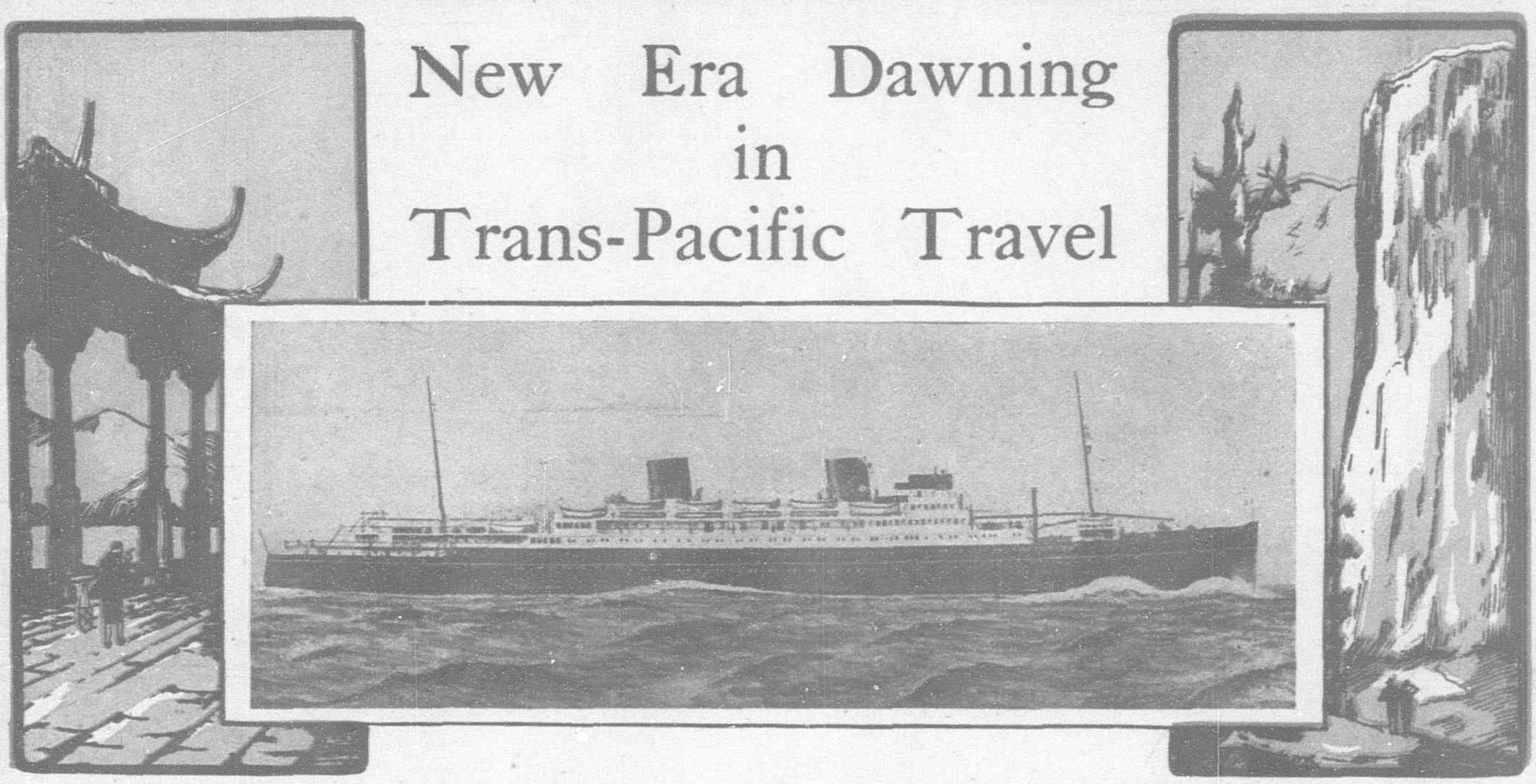

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The Far Eastern Review

ENGINEERING FINANCE COMMERCE

VOL. XXV SHANGHAI, OCTOBER, 1929 No. 10

The Engineer as Peacemaker

A World Engineering Congress meets in Tokyo this month. Many important technical subjects will come up for discussion; many papers will be read. The Engineer has made the Wortd what it is to-day. He has built up and he can destroy. If Civilization is to go forward, there must be a cessation of war. The peoples of the nations must be educated into the paths of Peace if the World is to progress. Some force must lead in this campaign of education. The Engineers of the World in Congress assembled at Tokyo are called upon to take the lead in this educational movement.

ONE of the most forceful and convincing arguments in favor of the Kellogg Peace Pact, is found in the leading article in the September number of *The General Electric Review*. Under the title of "Peace," Mr. John R. Hewitt, editor of this world-renowned magazine, handles the subject from the viewpoint of the scientist and the engineer; the men who have superseded the fighting man as the arbiter of a nation's existence; the men upon whose skill, resourcefulness and inventive genius rests the future of world civilization. These men have made a new world out of an old world by everlastingly finding and using new means of converting the natural products of the earth into serviceable commodities, but the moment war is declared their energies are diverted from the path of construction into the channels of destruction. They are called upon to tear down and destroy what their skill and energy has built up. We concur with Mr. Hewitt in that, it is for the engineers of the world to lead in the battle for "Peace." It is for them to settle which path they wish to pursue in the future.

It seems to Mr. Hewitt that it is an extraordinarily fortunate coincidence that the great privilege of proclaiming to the world at large that the very basis of international law had been revolutionized by the voluntary action of some forty nations, should have fallen to the lot of the first engineer President of the United States. The first requisite to make this great international pact bear the desired fruit, is strong understanding and able leadership in showing the intelligent people in every land that the thing undertaken is both possible and practical. And where could a stronger, better or more able leader be found than in him who so recently proclaimed it to the world.

We are, as Mr. Hewitt points out, living in a new world. Man has reached the stage of being an intelligent, thinking, reasoning creature. Intelligent man has reached a stage where he can be brought to see that the time has passed when there is either useful purpose or profit in man fighting man. The old fashioned statesmanship of the past is as bankrupt and as it was corrupt. The masses in many countries to-day are fortunately too intelligent and too well educated, to permit blundering politicians taking the poorest and most ignorant of their number by the hundreds and the thousands, dressing them up in uniforms, and shipping them off to kill their fellow human beings, whom the more often they know nothing about, and who, if they did know would be more likely to be their friends than their enemies.

Chivalry has disappeared from modern warfare. You can't be chivalrous with machine guns, high explosive shells, torpedoes, gas and aerial warfare. The glory and romance of war has gone. "These same scientists, engineers and inventors that have given us a new and modern world have also taken the romance and chivalry from war and made of it a double-distilled hell on earth. The pomp and panoply of military power and the glamor of war may be maintained by smart uniforms, marching of battalions, beating of the drums and the shouts of the people; it disappears on the battlefield. Where is the picturesqueness in cold, damp, water-sodden trenches? Where is the romance in being blown to pieces by the chemist's latest invention in high-explosive shells, or in inhaling his newest poison gas? Where is the chivalry in charging a battery of machine guns? Are airplanes and Zeppelins, dropping bombs on babies, pretty things? The slaughter of women and children, young men and maidens, grandfathers and grandmothers, and the destruction of homes from the skies, is but one of science's many contributions to modern warfare!

"There was romance at sea when the old ships, well beloved, with their sails full-bellied with the wind, and their decks upon decks of muzzle-loading guns, sailed into action—fired their broadsides—and grappled with the enemy. But is there the same romance in a squadron of modern battle cruisers with guns of larger range, and with engines of greater power and higher speed meeting an enemy and standing out of range themselves, while sinking the enemy's ships of lesser caliber? There is nothing chivalrous in or brave in torpedoing an unarmed merchantman and sending non-combatant men, women and children to a watery grave, and in scalding, burning, and drowning the engineers and stokers like vermin in a cage. It may all be scientifically efficient, but it is an abomination in the eyes of humanity.

"The scientists and engineers have made a hell on earth of war—they have destroyed the chivalry, stolen the glory and killed the romance, and the time has now arrived for them to use their highly developed brains in taking the lead in teaching the world that war can be outlawed. We believe there is sufficient intelligence, wisdom, and common sense in the world to-day that with able leadership the entire world can be brought to see that war is useless. The increased cost of modern warfare and the increase in the destruction of human lives and of property and the asinine procedure of holding a peace conference after the damage and destruction is done rather than settling the dispute

beforehand should convince all peoples of the virtue of the Briand-Kellogg Pact.

"Every one must fight if we have another war. The fighting won't be only on the battle fields. There will be fighting on the land and on the sea and in the skies. It will be carried right into the homes of the peoples. Every one will fight—and every one will lose. The cost would be unthinkable, and part of the price might be our civilizations. Even the victors must lose in modern warfare.

"The Napoleonic wars (1790-1815), a conflict that lasted 9,000 days, killed 2,100,000 human beings, and cost $3,070,000,000.

The American Civil War (1861-1865) lasted 1,350 days, cost 656,000 lives and $7,000,000,000.

The Franco-Prussian war (1870-1871) lasted for 210 days and cost 280,000 lives and $3,210,000,000.

The Russo-Japanese war (1904-1905) lasted 548 days, cost 160,000 lives and $2,100,000,000.

The above figures are for wars of the recent past, but how they pale before those of the World War!

The World War (1914-1918) lasted 1,563 days, cost 9,818,000 lives and $186,233,637,097.

"Now, all the real property in the United States, from the Canadian border to the boundaries of Mexico, and from the Atlantic to the shores of the Pacific Ocean, are worth considerably less than the cost of the World War.

It should interest and impress all engineers, business men, and all other people with common sense to learn that all the steam railroads and their equipment, all the motor vehicles, all the street railways, all the telegraph systems, all the telephone systems, and all the electric light and power stations of the entire United States of America could be purchased for a sum of money considerably less than one-quarter of the cost of the World War.

"We have been told that of all the moneys raised from the peoples of the earth in taxation, eighty cents out of every dollar goes to defray the costs of the wars of the past and in the preparation of future wars. The thing is absurd.

"We are always optimists. We realize in some measure what man has done for man since his constructive genius has been encouraged rather than suppressed. We believe in the evolution of intelligence and in the power of education and of work. What man has done in the past is as nothing to what he can, and will, do in the future. If he spends all his energies in peaceful pursuits the wonders of the new world that he is building will eclipse the wildest dreams of the most fantastic fairy stories.

"Most of the wars of the past have been fought over religious prejudices and for the conquest of territory. Both should be old-fashioned in our modern world. The chief cause for strife in the future, however well the facts may be disguised, is likely to be for the markets of the world. To-day these problems can be better and more economically settled around the conference table than on the battle field. Fear, suspicion, and ambition, the breeders of war, can best be subjected to the rule of wisdom and reason by a commonsense honest-to-all limitation of armaments.

"We are not pacifists nor are we preaching pacificism, but we do believe that patriotism may well expand its scope and be better satisfied in destroying poverty and in taking a justifiable pride in improving the living and working conditions of the people, and in bringing about a more equitable distribution of wealth, both nationally and internationally, than in vain-glorious boasting and declarations of superiority.

"If the first engineer President of the United States were to propose to the world at large that each nation spend a sum of money, a small fraction of their annual expenditure in the preparation for war, in educating their people as to what the Briand-Kellogg pact may, and should mean to the world, we believe that the signatures on that great document will remain forever honored.

"If the first engineer President of the United States should ask every nation in the world to declare July 24 the first great international holiday, and to dedicate it to declaring anew to every man, woman and child in the world that on July 24, 1929, the great nations of the earth outlawed war, we believe they could be educated into the path of peace rather than into the ways of war.

"In the future we can have either peace or war. It depends upon what the peoples believe. Some one must lead in educating them."

In an address, before the Pan-Pacific Club of Tokyo, Dr. M. Kamo, gave the following Japanese view of this important meeting:

The meetings are being organized under the auspices of the Kogakkai, and Baron Furuichi will be the president. His Imperial Highness, Prince Chichibu, has graciously consented to honor the Congress by being its Patron, and our government is giving the organizers substantial financial assistance. Most of the principal engineering concerns as well as the interested individuals are generously contributing towards the expenses, in order to provide the necessary setting for an international gathering that will not compare unfavorably with any of its predecessors.

Notwithstanding these efforts, however, the success of the Congress depends greatly on the co-operation extended to it by the general public, and to my mind the interest of the members of this Club, who are so prominent in international affairs, is a most important factor.

The Congress deals with subjects relating to every branch of engineering industry, including several questions such as Technical Education, Statistics, International Co-operation of Engineers, Science Management and Architecture, not usually found in the programme of such a Congress. These problems will be discussed in 13 to 14 sections, and we are expecting to have the most comprehensive conference ever held.

While the preliminary work for this Congress was in progress we received word in the summer of 1927 from the Central Office of the World Power Conference in London advising us to hold a Sectional Meeting of the World Power Conference at the same time. As it was thought that all members of the Congress would undoubtedly be interested in power problems, and the holding of such a Sectional Meeting simultaneously with the proposed Congress would naturally add to the size and importance of the coming international meeting, it was agreed that the Sectional Meeting of the World Power Conference would also be convened in Tokyo in the autumn of this year, under the auspices of the Japan Power Association, that is the Japanese National Committee for the World Power Conference.

At this Tokyo Sectional Meeting, however, it is proposed to discuss several important subjects pertaining to power, principally from an economic standpoint, while at the World Engineering Congress the discussions will be conducted along scientific and technical lines as far as the power problems are concerned. Such an arrangement was made with the idea of avoiding overlapping and repetition, which might otherwise occur, in the proceedings and papers of these conferences.

This Sectional Meeting is also approved by our government and will be subsidized substantially. The meetings of the Engineering Congress and the Sectional Meeting will be held concurrently in committee rooms of the House of Parliament, under the presidency of Baron Furuichi, and the members are privileged to attend whichever meetings they may be interested in. The papers offered will therefore be presented to either of the meetings according to the author's wish.

But we are not thinking, in this way, to burden the members with the programme of heavy work only. Much attention has been paid to the necessary recreation. Fortunately this country can show visitors much beautiful scenery and many things of historic and artistic interest. Our programme wholly covers these interests and pleasures in addition to the inspection tours to the principal industrial establishments and engineering works. Furthermore, a special exhibition of old arts is being arranged in connection with the Congress. In short, we wish thus to offer for inspection of the members the best Japan has produced in the past, what she is doing to-day, and the method by which she hopes to develop in the future. We hope to further in this way a mutual understanding of our respective countries, which is the necessary preliminary to international co-operation and indeed to a firm foundation for the peace of the world.

As some of you are probably aware, the idea of holding such an international congress in Japan was first expressed in my speech on the occasion of the dinner given by the American Delegation during the First World Power Conference held in London in 1924. This desire was more firmly cemented by the conference with the American representative engineers, when I was in New York on my way home at the beginning of 1925. Right after my return to Tokyo I received, on March 8, a cablegram from Dr. Sperry. a prominent American engineer and inventor, who is well known in this country. He advised me to put this idea into effect within a period of five years, and this was practically the beginning of the proposed

international congress. Preliminary steps were immediately taken in consultation with our leading engineers.

In the meantime our project was communicated to the Hon. Herbert Hoover, the then only engineer member in President Coolidge's Cabinet, who approved the idea by giving it as his opinion that :

"It would be a well deserved compliment to the progress made in Japan for the engineers of the world to send representatives to such a conference. It will have another important effect outside the promotion of engineering science and industry ."

This fact greatly aroused the interest of our government in the proposed Congress, and resulted in its decision to grant the Congress a substantial subsidy. I received word of this while in New York again in October 1926. I was then able to announce it to the representatives of the American engineering societies at a luncheon given in my honor on October 20. So great was their approval and satisfaction that the first public statement was then made of the intention to hold the World Engineering Congress in Tokyo in the autumn of 1929.

I am confident, therefore, that the inception of this idea would not have borne fruit without the enthusiastic support which it received from the engineering fraternity of the United States. It really illustrates how closely our country and the neighbor across the Pacific are able to work together.

Such being the case, Americans are most enthusiastic about the forthcoming Congress. They organized a special participation committee over a year ago, with Mr. Hoover as Honorary Chairman, and their preparations and interest distinctly surpass those of any others. However, in order to provide fully for the international nature of the coming conferences, I tried to stir up European countries during my visit there last autumn.

In all the countries I visited, conferences were held through ambassadors and ministers with the representatives of the government departments, the principal engineering societies, universities and industrial concerns. Each of them, impressed with the importance of the proposed conferences, has given me the assurance of their cordial support. In Great Britain and Sweden special committees have been organized for their participation. In Germany, France, Switzerland and Denmark, national committees for the World Power Conference are working along the same lines. Especially in Sweden Mr. Luebeck, Minister of Home Affairs, has taken much interest, and the government is making a special request to the Diet for an appropriation for sending delegates.

Every country is thus trying to have the finest representation of very high character at the Congress. Among prominent figures already registered are the following names :

From Great Britain—

Mr. Trench, Past President of the Institute of Civil Engineers.
Mr. Allen, President of the Institution of Mechanical Engineers.

From Germany—

Herr Krupp von Bolen.
Dr. Oskar von Miller, President of the German Technical Museum.
Dr. Koettgen, General Director of Siemens Schukert Werke.
Dr. Matschoss, Director of Verein Deutsches Ingenieure.

From Sweden—

Prof. Enstroem, Director of the Royal Academy of Engineering Science.
Dr. Ruths, Inventor of Ruths Steam Accumulator.
Dr. Ljungstroem, Inventor of Steam Turbine Locomotives.

From Denmark—

Mr. Lasen, President of Schmidt & Co., Cement Machine manufacturer, and a man of 72 years of age.

From the United States :—

Dr. Sperry, President of Sperry Gyroscope Co.
Mr. Holland, Chairman of National Research Council

I should expect now about 100 from European countries and 250 from America, counting delegates and their companions together. As to the papers to be presented, we have already received advance information for no less than 250 from abroad and an almost equal number from home.

We realise that it naturally involves a great work to consummate a project of this kind, and I cannot refrain from a word of personal appeal for your sympathetic co-operation in order to make the forthcoming Congress an outstanding success.

A review of outstanding industrial and engineering developments in the United States during recent years is contained in eighty scientific papers prepared by American engineers for presentation at the World Engineering Congress.

That this review will be an important contribution to the world's engineering knowledge is indicated by the names of the authors and the titles of the papers, which cover a wide variety of subjects and include virtually every branch of engineering. Rapid transit development, airplane design, interconnection of the nation's great power systems, the construction of bridges and tunnels, river and harbor engineering, raw materials, irrigation, safety in dam and reservoir construction, sanitary engineering, metallurgy, refrigeration, mining, structural engineering, telephones and radio transmission, marine engineering and ship design—these are a few of the high lights selected from the first group of papers assembled by the technical programme committee of the American committee in charge of arrangements for participation in the congress.

Among the contributors are Dr. Elmer A. Sperry, inventor of the gyroscope and chairman of the American committee ; Dr. Frank B. Jewett, vice-president of the American Telegraph and Telephone Company, in charge of research and technical development ; C. M. Keyes, president Curtiss Airplane and Motor Company ; John I. Stevens, former chief engineer of the Panama Canal and noted railway expert ; Ralph Modjeski, builder of the Delaware River Bridge at Philadelphia and many other notable bridges ; Dr. George Otis Smith, director of the United States Geological Survey ; Willis R. Whitney, director of research for the General Electric Company ; Major General Edgar Jadwin, chief of engineers, United States Army ; Robert Ridgway, chief engineer New York City Board of Transportation ; also Rear Admiral D. W. Taylor, former chief constructor, United States Navy, and a member of the National Advisory Committee for Aeronautics ; Professor D. C. Jackson, of Massachusetts Institute of Technology, School of Electric Power Production and Distribution ; C. E. Grunsky, of San Francisco, civil engineer and consultant on municipal engineering ; Farley Osgood, of New York, consulting electric engineer ; Ole Singstead, chief engineer New York State Bridge and Tunnel Commission and builder of the Holland Vehicular Tunnel ; Allen Hazen, of New York, hydraulic engineer and expert of dams ; Thaddeus Merriman, chief engineer New York City Board of Water Supply ; Harden F. Taylor, vice-president for scientific research of the Atlantic Coast Fisheries Company, and Mark L. Requa, mining engineer, of San Francisco.

The subject of lighting will be dealt with in a paper by F. W. Peek jr., consulting engineer to the General Electric Company, who recently announced the development of artificial lighting generators capable of producing a bolt of 5,000,000 volts. G. W. Fuller, consulting engineer, of New York, will present a paper on public health engineering. George A. Orrok, consulting electrical engineer, of New York, will discuss power plants. L. P. Alford, consulting editor McGraw-Hill Publishing Company, has prepared a paper on scientific industrial management. H. P. Moore, research professor of engineering materials, University of Illinois, will contribute a paper on "The Development of the Science of Structural Materials." C. K. Leith, professor of geology, University of Wisconsin, will discuss "The World's Iron Ore Supply." Roy V. Wright, of New York, managing editor of *The Railway Age* and other technical publications, will deal with railroad equipment.

Trends in standardized quality production will be treated by John H. Van Deventer, of New York, president of the Engineering Magazine Company. Political and economic aspects of nonferrous metal mining, from an international point of view, will be discussed by Professor Frank H. Probert, dean of the College of Mining, University of California.

Elwood Mead, of Berkeley, Calif., United States Commissioner of Reclamation, will present a review of irrigation growth in the United States. H. De Berkeley Parsons, consulting engineer, of New York, will discuss masonry dams. H. L. Seward, professor of mechanical engineering at Yale University, will present a paper on marine engineering and ship design.

The technical sessions of the World Engineering Congress will be held during the first week of the meeting, beginning November 1. The American delegation, which now consists of 250 engineers, and their families will sail from San Francisco on two special ships October 10.

(*Continued on page 447*).

Work of the Ministry of Railways in China

By GEORGE E. SOKOLSKY

FROM many standpoints, the principal reconstructive task in China is the rehabilitation of China's railways, the improvement of the road-bed and the rolling stock, the restoration of a modern service after years of civil war and the building of new lines to connect the vast areas of China to the eastern and central metropoli. This is the task which faces Mr. Sun Fo, Minister of Railways, who inherits a system which had depreciated during a decade of civil war. The Ministry of Railways at present controls 9,980.316 kilometers of trackage, according to Table I.

TABLE I*.—KILOMETERS OF RAILWAY OPERATED, CLASSIFIED BY USE AND DISTRIBUTED BY LINES

Names of Lines		*Main Line*	*Branch Lines*	*Second Track, Industrial Track, Loops, Sidings, etc.*	*Total Track*
Peping-Hankow		1,214.493	109.684	405.923	1,730.100
Peping-Mukden		846.737	128.097	445.125	1,419.959
Tientsin-Pukow		1,012.840	96.470	262.870	1,372.180
Shanghai-Nanking		311.040	16.093	88.020	415.153
Shanghai-H.-N.		280.652	5.880	66.275	352.807
Peping-Suiyuan		817.862	58.669	264.905	1,141.436
Cheng-Tai		242.950	——	107.533	350.483
Taokow-Chinghua		150.000	2.440	31.380	183.820
Kaifeng-Honan		184.001	——	37.758	221.759
Lung-Hai		613.386	——	101.277	714.663
Kirin-Changchun		123.180	4.560	34.340	162.080
Canton-Kowloon		143.300	——	20.570	163.870
Hupeh-Hunan		417.624	5.021	44.652	467.297
Ssu-Tao		312.110	114.130	76.210	502.450
Kiao-Tsi		395.200	58.099	188.142	641.441
Nanchang-Kiukiang		128.346	——	12.472	140.818
Chinese Government Railways	1926	7,193.721	599.143	2,187.452	9,980.316
	1925	6,644.537	602.807	2,114.705	9,362.049
	1924	6,938.070	607.938	2,086.746	9,632.754
	1923	6,780.836	493.046	1,992.414	9,266.296
	1922	6,193.739	430.412	1,743.911	8,368.062

These railways represent a constructional investment of $704,366,113.17 and a financial investment of $91,947,027.94 making a total investment, after deducting receipts on capital account of $771,217,544.94 or $75 per kilometer. Table II herewith gives these investment assets in detail as to each railway owned by the Ministry.

TABLE III.—COST OF ROAD AND EQUIPMENT

Name of Line		*Kilometer of Line Owned*	*Cost of Road and Equipment*	*Cost Per Kilometer of Line Owned*
Peping-Hankow		1,314.046	123,634,611.81	94,086.97
Peping-Mukden		986.653	106,069,811.25	107,504.68
Tientsin-Pukow		1,109.310	120,118,576.47	108,282.24
Shanghai-Nanking		327.133	33,581,904.12	102,655.20
Shanghai-H.-N.		286.532	24,502,078.43	85,512.54
Peping-Suiyuan		871.957	57,902,324.42	66,405.02
Cheng-Tai		242.950	25,936,886.23	106,758.12
Taokow-Chinghua		152.440	8,355,071.94	54,808.92
Kaifeng-Honan		184.001	15,637,965.03	84,988.48
Lung-Hai		(2)	——	——
Kirin-Changchun		123.610	8,976,654.38	72,620.78
Canton-Kowloon		143.300	15,885,199.27	110,852.75
Hupeh-Hunan		422.645	59,340,071.94	140,401.69
Ssu Tao		424.910	20,330,614.89	47,846.87
Kiao-Tsi		453.299	39,054,239.35	86,155.58
Nanchang-Kiukiang		128.346	11,891,535.41	92,652.17
Chinese Government Railways	1926	7,171.132	771,217,544.94	107,544.74
	1925	6,625.576	594,380,168.49	89,709.96
	1924	7,050.667	642,714,011.00	91,156.48
	1923	6,826.923	629,073,565.13	92,145.99
	1922	6,253.133	563,497,724.06	90,114.46

The actual cost of the equipment of these lines in 1926 was $107,544.75 for 7,171.132 kilometers.

The operating and income accounts show the possibilities of the lines. It must here be noted that the Ministry of Railways has only recently come into control of all the railways. Like his colleague, Mr. T. V. Soong, Mr. Sun Fo has been beset by military interference with his railways and his work. It was only during the month of July that he succeeded in completing his control of the Northern railways. Table IV then represents the report of an incomplete success; yet, how much better might it have been for China, had the Ministry of Railways operated unhampered by the interference of the militarists. The outstanding success among Chinese Government railways is the Peping-Mukden Line which made a profit of $7,855,251.45. Yet the total profit for all the railways, based on an operating revenue of $99,341,879.30 was only $3,495,702.97.‡ The smallness of the profit can only be explained by military interference.

*All references to currency is to be taken to mean Chinese currency unless otherwise indicated.
‡See also Table VIII.

TABLE II.—DISTRIBUTION OF INVESTMENT ASSETS

Items	*Cheng-Tai*	*Taokow-Chinghua*	*Kaifeng-Honan*	*Lung-Hai*	*Kirin-Changchun*	*Canton-Kowloon*
PART I.—CONSTRUCTION ACCOUNTS :—						
C—1 General Expenditures	3,308,206.37	1,727,949.83	1,905,620.63	(2)	1,014,278.84	1,571,475.75
C—2 Preliminary Expenditure	601,750.89	30,598.09	72,683.10		45,894.89	100,875.65
C—3 Land	325,728.50	379,820.69	298,462.27		242,650.79	1,690,631.47
C—4 Formation	2,613,940.48	126,975.50	1,487,930.63		692,284.05	2,089,839.34
C—5 Tunnels	590,214.99	..	489,482.21		238,174.04	..
C—6 Bridgeworks	2,265,290.31	385,697.51	2,896,908.09		740,581.72	2,300,563.44
C—7 Line Protection	62,027.26	3,417.36	13,517.31		1,425.43	70,650.89
C—8 Telegraphs and Telephones	148,783.10	43,645.98	37,969.19		131,246.06	34,398.52
C—9 Track	3,406,502.82	1,783,181.85	2,844,210.67		1,789,576.12	2,749,965.87
C—10 Signal and Switches	370,427.02	103,023.33	169,601.17		130,905.51	77,256.03
C—11 Stations and Buildings	2,425,695.40	381,561.53	745,221.78		1,517,981.20	1,002,303.12
C—12 Central Mechanical Works	888,944.13	147,249.98	..		379,119.26	91,755.06
C—13 Special Mechanical Works	24,892.81	10,473.91	..		..	..
C—14 Plant	441,842.08	8,782.00	424,009.71		80,557.05	247,035.86
C—15 Rolling Stock	6,434,176.61	2,078,159.30	3,235,824.76		1,729,599.49	1,387,884.09
C—16 Maintenance	177,104.05	..	139,531.11		21,963.43	9,842.18
C—17 Docks, Harbors and Wharves	..	..	..		..	779.06
C—18 Floating Equipments	..	..	..		..	..
Total Part I	24,085,526.82	7,210,536.86	14,760,972.63		8,756,237.79	13,425,256.33
PART II.—FINANCIAL ACCOUNTS :—						
C—19 Interest During Construction	2,996,120.17	438,799.97	2,802,156.73		606,304.98	2,095,603.14
C—20 Exchange	469,015.77	705,735.11	..		43,705.33 *Less*	85,337.60
C—21 Unclassified	..	..	..		..	449,677.40
Total Part II	3,465,135.94	1,144,535.08	1,585,323.59		650,010.31	2,459,942.94
Total Part I and II	27,550,662.76	8,355,071.94	16,346,296.22		9,406,248.10	15,885,199.27
Deduct Receipts on Capital Account	1,613,776.53	..	708,331.19		429,593.72	..
Total Cost of Road and Equipment	25,936,886.23	8,355,071.94	15,637,965.03		8,976,654.38	15,885,199.27
Cost of Other Physical Property	..	..	..		24,387.08	..
Cost of Non Physical Assets	..	..	..		40,670.00	..
Total Cost of Property Carried to Balance Sheet	25,936,886.23	8,355,071.94	15,637,965.03		9,041,711.46	15,885,199.27

(2) Under Construction

TABLE II.—DISTRIBUTION OF INVESTMENT ASSETS —*(Continued)*

Items	*Hupeh-Hunan*	*Ssu-Tao*	*Kiao-Tsi*	*Nanchang-Kiukiang*	*Chinese Government Railways*
PART I.—CONSTRUCTION ACCOUNTS :—					
C—1 General Expenditures	6,468,810.28	2,783,623.27	..	1,701,601.88	58,027,292.23
C—2 Preliminary Expenditure	5,535,733.56	101,420.01	..	309,600.43	10,005,542.99
C—3 Land	2,178,982.19	710,337.09	1,735,389.90	441,795.09	25,344,897.64
C—4 Formation	3,957,632.81	1,386,668.48	1,591,567.40	1,021,696.53	40,892,066.27
C—5 Tunnels	..	..	..	..	3,009,845.55
C—6 Bridgeworks	5,509,584.22	2,338,816.64	7,061,662.49	2,445,804.28	90,157,791.15
C—7 Line Protection	91,992.57	26,198.31	59,932.20	6,366.87	1,410,523.90
C—8 Telegraphs and Telephones	159,938.20	419,796.64	714,808.99	25,897.32	3,716,433.15
C—9 Track	6,852,434.99	7,554,301.69	8,270,748.78	1,705,242.64	27,442,446.39
C—10 Signal and Switches	175,429.60	262,557.73	280,938.51	38,757.23	7,873,236.07
C—11 Stations and Buildings	1,383,521.78	3,180,455.17	3,637,383.75	355,335.03	48,807,360.31
C—12 Central Mechanical Works	415,008.97	..	2,364,450.17	56,279.42	13,060,609.64
C—13 Special Mechanical Works	7,657.16	..	200,305.79	195.72	1,257,069.42
C—14 Plant	374,943.98	202,369.51	134,919.26	142,315.15	5,271,611.72
C—15 Rolling Stock	5,233,439.59	..	13,002,132.11	871,525.68	57,464,342.53
C—16 Maintenance	1,016,798.45	292,152.66	..	300,092.44	7,519,345.21
C—17 Docks, Harbors and Wharves	84,208.51	..	..	..	2,211,314.18
C—18 Floating Equipments	18,795.90	..	..	25,464.50	894,384.82
Total Part I	40,464,912.76	19,259,099.35	39,054,239.35	9,447,970.21	704,366,113.17
PART II.—FINANCIAL ACCOUNTS :—					
C—19 Interest During Construction	18,732,556.61	1,874,612.51	..	2,419,026.41	67,862,311.39
C—20 Exchange	2,854,074.01	1,597,392.01 *Less*	..	170,719.14	1,663,424.82
C—21 Unclassified	..	1,311,329.73	..	..	22,421,291.73
Total Part II	21,586,630.62	1,588,550.23	..	2,589,745.55	91,947,027.94
Total Part I and II	62,051,543.38	20,847,649.43	39,054,239.35	12,037,715.76	796,313,141.11
Deduct Receipts on Capital Account	2,711,471.44	517,034.54	..	146,180.35	25,095,596.17
Total Cost of Road and Equipment	59,340,071.94	20,330,614.89	39,054,239.35	11,891,535.41	771,217,544.94
Cost of Other Physical Property	..	..	..	..	..
Cost of Non Physical Assets	50,500.00	..	2,300.00	..	..
Total Cost of Property Carried to Balance Sheet	59,390,571.94	20,330,614.89	39,056,539.35	11,891,535.41	771,217,544.94

TABLE IV.—CONDENSED OPERATING AND INCOME ACCOUNTS

Items	*Peping-Hankow* Totals	*Peping-Hankow* Balances	*Peping-Mukden* Totals	*Peping-Mukden* Balances	*Tientsin-Pukow* Totals	*Tientsin-Pukow* Balances
Operating Revenues	$14,739,136.89		$23,487,168.68		$6,119,258.16	
Operating Expenses	11,874,787.19		13,598,979.78		5,838,625.19	
Net Operating Revenues		2,864,349.70		9,888,188.90		280,632.97
Income Debits	4,619,207.68		2,269,992.60		4,103,033.46	
Income Credits	544,728.16		237,055.15		11,009.15	
Net Income Debits		4,074,479.52		2,032,937.45		4,092,024.31
Credit (or Debit) Balance for the Year		*1,210,129.82		7,855,251.45		* 3,811,391.34

Items	*Shanghai-Nanking* Totals	*Shanghai-Nanking* Balances	*Shanghai-Hangchow-Ningpo* Totals	*Shanghai-Hangchow-Ningpo* Balances	*Peping-Suiyuan* Totals	*Peping-Suiyuan* Balances
Operating Revenues	$9,157,252.39		$4,978,625.88		$5,124,348.44	
Operating Expenses	5,805,866.18		3,553,958.09		5,967,506.84	
Net Operating Revenues		3,351,386.21		1,424,667.79		* 783,158.40
Income Debits	1,838,390.99		610,954.69		3,183,129.59	
Income Credits	62,367.10		204,680.32		6,542.70	
Net Income Debits		1,776,023.89		406,274.37		3,176,586.89
Credit (or Debit) Balance for the Year		1,575,362.32		1,018,393.42		* 3,959,745.29

Items	*Cheng-Tai* Totals	*Cheng-Tai* Balances	*Taokow-Chinghua* Totals	*Taokow-Chinghua* Balances	*Kaifeng-Honan* Totals	*Kaifeng-Honan* Balances
Operating Revenues	$5,111,239.74		$1,095,502.84		$2,688,853.12	
Operating Expenses	2,149,656.32		659,500.19		1,064,381.57	
Net Operating Revenues		2,961,583.42		436,002.65		1,624,471.55
Income Debits	173,695.15		618,377.89			
Income Credits	47,873.08		3,055.19			
Net Income Debits		125,822.07		615,322.70		
Credit (or Debit) Balance for the Year		2,835,761.35		* 179,320.05		

* Denotes Loss or Debit Balance

Items	*Lung-Hai* Totals	*Lung-Hai* Balances	*Kirin-Changchun* Totals	*Kirin-Changchun* Balances	*Canton-Kowloon* Totals	*Canton-Kowloon* Balances
Operating Revenues	$4,491,580.87		$2,914,323.25		$1,686,096.60	
Operating Expenses	2,291,969.76		1,989,942.45		1,159,978.69	
Net Operating Revenues		2,199,611.11		924,380.80		526,117.91
Income Debits			850,421.94		620,997.86	
Income Credits			119,966.46		11,332.43	
Net Income Debits	(1)			730,455.48		609,665.43
Credit (or Debit) Balance for the Year				193,925.32		* 83,547.52

Items	*Hupeh-Hunan* Totals	*Hupeh-Hunan* Balances	*Ssu-Tao* Totals	*Ssu-Tao* Balances	*Kiao-Tsi* Totals	*Kiao-Tsi* Balances
Operating Revenues	$1,061,902.67		$7,675,284.43		$8,085,500.70	
Operating Expenses	1,976,295.08		3,684,811.95		6,946,148.49	
Net Operating Revenues		* 914,392.41		3,990,472.48		1,139,352.21
Income Debits	2,656,735.39		4,511,761.31		2,611,650.71	
Income Credits	43,874.98		1,496,362.74		263,369.74	
Net Income Debits		2,612,860.41		3,015,398.57		2,348,280.97
Credit (or Debit) Balance for the Year		* 3,527,252.82		975,073.91		* 1,208,928.76

* Loss or debit balance

(1) Under Construction (2) Includes $2,199,611.11 Net Revenues of Lung-Hai which must be credited to Construction costs.

TABLE IV.—CONDENSED OPERATING AND INCOME ACCOUNTS.—*(Continued)*

Items	*Nanchang-Kiukiang Totals*	*Balances*	*Chinese Government Totals*	*Railways Balances*
Operating Revenues	$865,804.64		$99,341,879.30	
Operating Expenses	728,793.37		69,291,201.14	
Net Operating Revenues		137,011.27		30,050,678.16
Income Debits	979,376.35		29,647,725.61	
Income Credits	40,533.22		3,092,750.42	
Net Income Debits		938,843.13		26,554,975.19
Credit (or Debit) Balance for the Year		* 801,831.86		3,495,702.97

TABLE V.—ANALYSIS OF OPERATING REVENUES

Items	*Peping-Hankow Amount*	%	*Peping-Mukden Amount*	%	*Tientsin-Pukow Amount*	%
I.—Transportation Revenues	$14,296,562.76		$23,057,918.81		$6,026,024.67	
R—1 Passenger Service—Passengers	$4,153,017.71	28.18	8,946,767.00	38.09	4,213,302.27	64.53
R—2 Passenger Service—Other	292,610.53	1.99	1,026,878.92	4.37	274,124.28	4.48
R—3 Goods Service—Goods	9,277,828.65	62.96	12,104,311.02	51.53	1,483,815.74	24.25
R—4 Goods Service—Other	573,105.87	3.89	978,765.96	4.17	54,760.58	0.90
R—5 Ferry Service			1,195.91	0.01	21.80	(1)
II.—Other Operating Revenues	442,574.13		424,922.17		93,233.49	
R—6 Telegraph	‡ 388.45	(1)	78,120.09	0.33	5,005.65	0.08
R—7 Profits of Central Mechanical Works	11,068.20	0.08	1,479.32	0.01	324.12	(1)
R—8 Rents	307,417.50	2.05	277,948.59	1.18	63,847.49	1.05
R—9 Incidental Revenues	124,476.88	0.85	67,374.17	0.29	24,056.23	0.39
III.—R—10 Auxiliary Operations				4,327.70 0.02		
IV.—R—11 Interchange of Rolling Stock						
Total Operating Revenues	14,739,136.89	100.00	23,487,168.68	100.00	6,119,258.16	100.00

Items	*Shanghai-Nanking Amount*	%	*Shanghai-Hangchow-Ningpo Amount*	%	*Peping-Suiyuan Amount*	%
I.—Transportation Revenues	$9,014,168.89		$4,921,790.46		$4,715,711.41	
R—1 Passenger Service—Passenger	5,909,342.06	64.53	$3,111,399.20	62.49	$1,459,922.53	28.16
R—2 Passenger Service—Other	488,228.96	5.33	438,444.13	8.81	119,404.20	2.30
R—3 Goods Service—Goods	2,213,546.32	24.17	1,305,225.32	26.22	3,048,375.49	58.80
R—4 Goods Service—Others	403,051.55	4.40	66,721.81	1.34	88,009.19	1.70
R—5 Ferry Service						
II.—Other Operating Revenues	125,690.42		58,594.04		468,637.03	
R—6 Telegraph	604.20	0.01	1,926.84	0.04	1,799.14	0.04
R—7 Profits of Central Mechanical Works	6,533.16	0.07				
R—8 Rents	19,351.92	0.21	10,024.94	0.20	225,750.78	4.35
R—9 Incidental Revenues	46,642.26	0.94	241,087.11	4.65	16,213.21	0.32
III.—R—10 Auxiliary Operations	3,121.78	0.04		‡1,758.62 0.04		
IV.—R—11 Interchange of Rolling Stock	14,271.30	0.16				
Total Operating Revenue	9,157,252.39	100.00	$4,978,625.88	100.00	$5,184,348.44	100.00

(1) Denotes Less than .01 per cent.

Items	*Cheng-Tai Amount*	%	*Taokow-Chinghua Amount*	%	*Kaifeng-Honon Amount*	%
I.—Transportation Revenues	$5,007,508.84		$1,072,619.58		$2,647,974.51	
R—1 Passenger Service—Passenger	$ 909,336.10	17.79	$219,315.44	20.02	$963,613.10	35.84
R—2 Passenger Service—Other	83,637.75	1.64	57,774.81	5.27	245,798.38	9.14
R—3 Goods Service—Goods	3,753,562.99	73.44	605,111.56	55.24	654,615.23	24.35
R—4 Goods Service—Other	260,972.00	5.10	190,417.77	17.38	783,947.80	29.15
R—5 Ferry Service						
II.—Other Operating Revenues	103,730.90		22,883.26		40,878.61	
R—6 Telegraph			523.50	0.05	71.97	(1)
R—7 Profits of Central Mechanical Works			4,518,42	0.41	16,564.86	0.62
R—8 Rents	87,517.69	1.71	11,976.52	1.09	11,172.16	0.41
R—9 Incidental Revenues	16,213.21	0.32	5,864.82	0.54	13,069.62	0.49
III.—R—10 Auxiliary Operations						
IV.—R—11 Interchange of Rolling Stock						
Total Operating Revenue	5,111,239.74	100.00	$1,095,502.84	100.00	$2,688,853.12	100.00

Items	*Lung-Hai Amount*	%	*Kirin-Changchun Amount*	%	*Canton-Kowloon Amount*	%
I.—Transportation Revenues	$4,430,025.73		$2,855,316.60		$1,671,127.34	
R—1 Passenger Service—Passenger	$1,534,834.55	34.17	$927,925.61	31.84	$1,398,673.87	82.95
R—2 Passenger Service—Other	284,212.12	6.33	30,360.42	1.04	9,465.79	0.56
R—3 Goods Service—Goods	2,221,962.48	49.47	1,696,363.56	68.21	262,981.68	15.60
R—4 Goods Service—Other	389,016.58	8.66	200,667.01	6.88	6.00	(1)
R—5 Ferry Service						
II.—Other Operating Revenues	59,265.14		45,528.80		14,969.26	
R—6 Telegraph	156.41	(1)	3,453.61	0.12		
R—7 Profits of Central Mechanical Works	32,464.87	0.72	879.61	0.03	7.54	(1)
R—8 Rents	16,864.53	0.38	8,930.49	0.31	6,734.58	0.40
R—9 Incidental Revenues	9,779.33	0.22	32,265.09	1.11	8,227.14	0.19
III.—R—10 Auxiliary Operations	2,290.00	0.05				
IV.—R—11 Interchange of Rolling Stock			13,477.85	0.46		
Total Operating Revenues	4,491,580.87	100.00	$2,914,323.25	100.00	$1,686,096.60	100.00

(1) Not less than 0.1 per cent.

* Loss or debit balance

‡ Decrease.

TABLE V.—ANALYSIS OF OPERATING REVENUES.—*(Continued)*

Items	*Hupeh-Hunan* Amount	%	*Ssu-Tao* Amount	%	*Kiao-Tsi* Amount	%
I.—Transportation Revenues	$1,049,450.41		$7,654,170.77		$7,907,522.36	
R—1 Passenger Service—Passenger	$372,734.00	35.10	$1,699,719.82	22.15	$2,684,978.81	33.21
R—2 Passenger Service—Other	19,874.07	1.87	42,938.94	0.56	136,462.12	1.69
R—3 Goods Service—Goods	628,479.08	59.19	5,689,453.31	74.13	5,002,018.73	35.89
R—4 Goods Service—Other	28,363.26	2.67	222,058.70	2.89	84,064.70	1.04
R—5 Ferry Service	..		..		..	
II.—Other Operating Revenues	12,452.26		21,113.66		157,315.34	
R—6 Telegraph	3,066.09	0.29	3,309.90	0.04	4,948.21	0.06
R—7 Profits of Central Mechanical Works	..		..		..	
R—8 Rents	4,226.05	0.40	1,330.20	0.02	2,142.00	0.02
R—9 Incidental Revenues	5,160.12	0.48	16,473.56	0.21	150,225.13	1.86
III.—R—10 Auxiliary Operations	..		..		..	
IV.—R—11 Interchange of Rolling Stock	..		..		20,663.00	0.26
Total Operating Revenues	1,061,902.67	100.00	$7,675,284.43	100.00	$8,085,500.70	100.00

Items	*Nanchang-Kiukiang* Amount	%	*Chinese Government Railways* Amount	%
I.—Transportation Revenues	$860,529.64		$97,188,422.78	97.83
R—1 Passenger Service—Passenger	$493,270.95	56.97	$38,998,151.02	
R—2 Passenger Service—Other	51,445.18	5.94	3,601,660.60	
R—3 Goods Service—Goods	310,754.23	35.89	50,258,405.39	
R—4 Goods Service—Others	4,841.38	0.56	4,328,770.16	
R—5 Ferry Service	217.90	0.03	1,435.61	
II.—Other Operating Revenues	5,275.00		2,097,063.51	2.11
R—6 Telegraph	..		102,597.16	
R—7 Profits of Central Mechanical Works	..		73,840.10	
R—8 Rents	..		1,055,235.44	
R—9 Incidental Revenues	5,275.00	0.61	865,390.81	
III.—R—10 Auxiliary Operations	..		7,980.86	0.01
IV.—R—11 Interchange of Rolling Stock	..		48,412.15	0.05
Total Operating Revenues	$865,804.64	100.00	$99,341,879.30	100.00

TABLE VI.—ANALYSIS OF OPERATING EXPENSES

Items	*Peping-Hankow* Amount	%	*Peping-Mukden* Amount	%	*Tientsin-Pukow* Amount	%
E—1 General Expenses	$3,656,977.13		$3,012,296.13		$1,881,249.46	32.22
Administration	$1,915,191.82	16.13	$1,226,895.14	9.03	$1,166,707.11	
Special	1,741,785.31	14.67	1,785,400.99	13.13	714,542.35	
E—2 Traffic Expenses	1,844,478.30	15.53	1,848,552.21	13.59	747,016.51	12.79
E—3 Running Expenses	2,364,606.69		3,161,424.33		1,184,735.56	20.29
Locomotive	1,624,305.94	13.68	2,722,466.37	20.02	939,033.84	
Carriage and Wagon	143,420.26	1.21	143,086.54	1.05	82,109.37	
Motor Vehicles	—		...		...	
Traffic	588,117.65	4.95	282,281.48	2.08	163,592.35	
Flotilla	8,762.84	0.07	13,589.94	0.10	...	
E—4 Maintenance of Equipment	2,192,731.89		3,259,978.03		1,227,192.80	21.02
Locomotive Department	2,192,731.89	18.47	3,257,548.18	23.95	1,227,192.80	
Flotilla Department	...		2,429.85	0.02	...	
E—5 Maintenance of Way and Structures	1,815,993.18		2,314,729.08		798,189.36	13.67
Engineering Department	1,653,101.37	13.92	1,932,465.26	14.21	645,273.38	
Other Department	162,891.81	1.37	382,263.82	0.01	152,915.98	
E—6 Interchange Of Rolling Stock	...		2,000.00	0.01	241.50	0.01
Total Operating Expenses	$11,874,787.19	100.00	$13,598,979.78	100.00	$5,838,625.19	100.00

Items	*Shanghai-Nanking* Amount	%	*Shanghai-Hangchow-Ningpo* Amount	%	*Peping-Suiyuan* Amount	%
E—1 General Expenses	$924,809.35	15.93	$625,211.52	17.59	$1,840,737.61	30.85
Administration	$427,255.50		$302,634.11		$783,136.86	
Special	497,553.85		322,577.41		1,057,600.75	
E—2 Traffic Expenses	1,295,975.57	22.32	625,390.40	17.88	714,291.84	11.97
E—3 Running Expenses	1,694,817.19	29.19	935,093.26	26.31	1,027,814.94	17.22
Locomotive	1,506,807.08		856,012.14		854,466.40	
Carriage and Wagon	53,962.32		28,872.79		91,068.43	
Motor Vehicles	...		...		...	
Traffic	134,047.79		50,208.33		82,280.11	
Flotilla	...		...		...	
E—4 Maintenance of Equipment	1,092,434.57	18.82	580,988.75	16.35	1,341,961.97	22.49
Locomotive Department	1,092,434.57		580,988.75		1,341,961.97	
Flotilla Department	...		...		...	
E—5 Maintenance of Way and Structures	797,829.50	13.74	763,002.86	21.47	1,042,700.48	17.47
Engineering Department	739,663.06		741,474.88		930,552.83	
Other Department	58,166.44		21,527.98		112,147.65	
E—6 Interchange Of Rolling Stock	...		14,271.30	0.40	...	
Total Operating Expenses	$5,805,866.18	100.00	$3,553,958.09	100.00	$5,967,506.84	100.00

TABLE VI.—ANALYSIS OF OPERATING EXPENSES.—*(Continued)*

Items	*Cheng-Tai* Amount		%	*Taokow-Chinghua* Amount		%	*Kaifeng-Honan* Amount		%
E—1 General Expenses		$423,238.30			$261,956.68	39.72		$252,436.71	
Administration	$261,180.07		12.15	$137,627.46			$170,608.16		16.03
Special	162,058.23		7.54	124,329.22			81,828.55		7.69
E—2 Traffic Expenses		252,062.24	11.73		71,838.51	10.89		110,241.05	10.36
E—3 Running Expenses		346,347.99			111,129.70	16.85		195,243.10	
Locomotive	260,317.42		12.11	93,856.37			147,930.84		13.90
Carriage and Wagon	10,663.80		0.50	4,789.58			4,968.77		0.47
Motor Vehicles	...			...			...		
Traffic	75,366.77		3.50	12,483.75			42,343.49		3.97
Flotilla	...			...			...		
E—4 Maintenance of Equipment		717,929.29	33.40		115,981.22	17.59		294,555.25	
Locomotive Department	717,929.29			115,981.22			294,555.25		27.67
Flotilla Department	...			...			...		
E—5 Maintenance of Way and Structures		410,078.50			98,594.08	14.95		211,905.46	
Engineering Department	397,082.21		18.47	95,426.96			202,855.87		19.06
Other Department	12,996.29		0.60	3,167.12			9,049.59		.85
E—6 Interchange Of Rolling Stock		...			...			...	
Total Operating Expenses		$2,149,656.32	100.00		$659,500.19	100.00		$1,064,381.57	100.00

Items	*Lung-Hai* Amount		%	*Kirin-Changchun* Amount		%	*Canton-Kowloon* Amount		%
E—1 General Expenses		$540,844.44			$501,084.47			$245,137.59	21.13
Administration	$335,298.46		14.63	$220,799.71		11.10	$135,267.75		
Special	205,545.98		8.97	280,284.76		14.08	109,869.84		
E—2 Traffic Expenses		267,816.32	11.68		348,748.20	17.52		145,341.56	12.53
E—3 Running Expenses		417,058.58			342,094.01			322,263.52	27.78
Locomotive	337,096.27		14.71	313,695.59		15.76	293,665.60		
Carriage and Wagon	10,861.57		0.47	11,962.00		0.60	8,163.89		
Motor Vehicles	...			...			1,600.59		
Traffic	69,100.74		3.02	16,436.42		0.83	18,833.44		
Flotilla	...			...			...		
E—4 Maintenance of Equipment		538,430.69			394,145.34			185,098.83	15.96
Locomotive Department	538,430.69		23.49	394,145.34		19.81	185,098.83		15.96
Flotilla Department	...			...			...		
E—5 Maintenance of Way and Structures		527,819.73			403,870.43			262,137.19	22.60
Engineering Department	506,701.21		22.11	375,283.39		18.86	260,347.04		
Other Department	21,118.52		0.92	28,587.04		1.44	1,790.15		
E—6 Interchange Of Rolling Stock		...			...			...	
Total Operating Expenses		$2,291,969.76	100.00		$1,989,942.45	100.00		$1,159,978.69	100.00

Items	*Hupeh-Hunan* Amount		%	*Ssu-Tuo* Amount		%	*Kiao-Tsi* Amount		%
E—1 General Expenses		$422,621.57	21.38		$805,565.94			$1,984,288.82	28.57
Administration	$288,463.46			$432,916.35		11.75	$1,012,824.70		
Special	134,158.11			372,649.59		10.11	971,464.12		
E—2 Traffic Expenses		232,310.26	11.76		603,676.59	16.38		919,821.68	13.24
E—3 Running Expenses		436,933.61	22.11		841,644.83			1,298,660.34	18.70
Locomotive	355,934.05			739,940.48		20.08	1,109,167.38		
Carriage and Wagon	27,798.35			38,002.75		1.03	56,011.43		
Motor Vehicles	...			...			...		
Traffic	50,993.09			63,701.60		1.73	133,481.53		
Flotilla	2,208.12			...			...		
E—4 Maintenance of Equipment		398,820.58	20.18		335,345.30	9.10		1,813,185.76	26.10
Locomotive Department	398,820.58		20.18	335,345.30			1,813,185.76		26.10
Flotilla Department	...			...			...		
E—5 Maintenance of Way and Structures		479,227.31	24.25		862,798.55			930,191.89	13.39
Engineering Department	463,299.79			834,090.95		22.64	805,154.77		
Other Department	15,927.52			28,707.60		0.78	125,037.12		
E—6 Interchange Of Rolling Stock		6,381.75	0.32		235,780.74	6.40		...	
Total Operating Expenses		$1,976,295.08	100.00		$3,684,811.95	100.00		$6,946,148.49	100.00

Items	*Nanchang-Kiukiang* Amount		%	*Chinese Government Railways* Amount		%
E—1 General Expenses		$177,181.93	24.30		$17,555,637.65	25.33
Administration	$106,521.71			$8,923,328.37		
Special	70,660.22			8,632,309.28		
E—2 Traffic Expenses		90,534.00	12.42		10,128,095.24	14.62
E—3 Running Expenses		189,737.03	26.07		14,869,604.68	21.46
Locomotive	158,376.08			12,313,071.85		
Carriage and Wagon	2,297.91			718,039.76		
Motor Vehicles	...			1,600.59		
Traffic	12,481.90			1,795,750.44		
Flotilla	16,581.14			41,142.04		
E—4 Maintenance of Equipment		127,533.01	17.49		14,616,313.28	21.09
Locomotive Department	122,175.94			14,608,526.36		
Flotilla Department	5,357.07			7,786,92		
E—5 Maintenance of Way and Structures		143,807.40	19.72		11,862,875.00	17.13
Engineering Department	135,171.97			10,717,944.94		
Other Department	8,635.43			1,144,930.06		
E—6 Interchange of Rolling Stock		...			258,675.29	0.37
Total Operating Expenses		$728,793.37	100.00		$69,291,201.14	100.00

Table VII.—Analysis of Income Debit and Credit Entries.

Items	Peping-Hankow	Peping-Mukden	Tientsin-Pukow	Shanghai-Nanking	Shanghai-H.-N.	Peping-Suiyuan
Accrued Credits to Income						
I—1 Balance, Net Operating Revenue	$2,864,349.70	$9,888,188.90	$ 280,632.97	$3,351,386.21	$1,424,667.79	...
I—2 Income from Securities	25,101.00	...	766.38	410.96	...	2,008.26
I—3 Interest	480,927.31	30,108.65	3,545.03	14,235.82	10,368.48	1,658.98
I—4 Profit on Industrial Investments	...	...	...	...	...	...
I—5 Rents Receivable	37,364.01	44,603.56	6,253.00	47,161.79	193,889.27	...
I—6 Exchange, Net Credit	1,335.81	161,238.16	439.39	...	...	2,865.17
I—7 Miscellaneous Credits	0.03	1,104.78	5.35	558.53	422.57	10.29
Total Credit to Income	$3,409,077.86	$10,125,244.05	$291,642.12	$3,413,753.31	$1,629,348.11	6,542.70
Accrued Charges Against Income						
I—8 Balance, Net Operating Loss	...	...	...	...	...	783,158.40
I—9 Interest on Funded Debt	1,633,378.14	526,139.42	3,320,333.54	1,476,797.40	477,815.04	828,890.96
I—10 Interest on Current Debt	2,737,153.09	894,540.03	234,863.42	...	...	2,316,883.98
I—11 Contractual Dividends	...	...	...	...	...	...
I—12 Government Interest	...	...	...	91,434.70	...	...
I—13 Loss On Industrial Investments	363.99	...	...	...	...	...
I—14 Amortization of Discount on Funded Debt	177,143.87	75,900.00	...	49,608.26	59,605.88	...
I—15 Taxes	50,509.04	11,936.28	...	424.05	842.79	...
I—16 Rent Payable	11,418.20	20,802.16	538,525.00	175,728.15	8,551.16	2,685.00
I—17 Discount on Depreciated Currency	7,440.46	4,243.61	6,374.46	25,573.71	5,300.97	32,886.62
I—18 Exchange, Net Debit	1,778.89	733,977.39	855.32	18,758.68	25,645.35	1,783.03
I—19 Miscellaneous Debits	22.00	2,453.71	2,081.72	66.04	33,193.50	...
Total Debits to Income	$4,619,207.68	$2,269,992.60	$4,103,033.46	$1,838,390.99	$610,954.69	$3,966,287.99
Credit (or Debit) Balances of the Year	*1,210,129.82	7,855,251.45	*3,811,391.34	1,575,391.34	1,575,362.32	1,018,393.42

Items	Cheng-Tai	Taokow-Chinghua	Kaifeng-Honan	Lung-Hai	Kirin-Changchun	Canton-Kowloon
Accrued Credits to Income						
I—1 Balance, Net Operating Revenue	$2,961,583.42	$436,002.65	...	(1)	$924,380.80	$526,117.91
I—2 Income from Securities	...	...	...	...	...	...
I—3 Interest	35,505.58	2,718.61	...	...	19,568.22	2,883.78
I—4 Profit on Industrial Investments	...	...	...	...	...	...
I—5 Rents Receivable	7,643.85	30.00	...	...	36,314.35	3,620.63
I—6 Exchange, Net Credit	69.33	74.95	...	...	56,061.94	4,736.23
I—7 Miscellaneous Credits	4,654.32	231.63	...	...	8,021.95	91.79
Total Credit to Income	$3,009,456.50	$439,057.84	...	...	$1,044,347.26	$537,450.34
Accrued Charges Against Income						
I—8 Balance, Net Operating Loss	...	...	...	...	...	...
I—9 Interest on Funded Debt	73,349.45	309,423.44	...	...	331,018.51	512,349.15
I—10 Interest on Current Debt	447.50	3.64	...	...	...	14,414.53
I—11 Contractual Dividends	...	...	...	...	...	...
I—12 Government Interest	...	299,215.74	...	...	126,717.51	...
I—13 Loss On Industrial Investments	...	...	...	...	6,719.30	...
I—14 Amortization of Discount on Funded Debt	95,000.00	1,609.02	...	...	15,235.50	33,000.00
I—15 Taxes	...	...	...	...	...	14.15
I—16 Rent Payable	...	6,951.00	...	...	75,186.38	...
I—17 Discount on Depreciated Currency	3,209.59	...	...	...	...	...
I—18 Exchange, Net Debit	115.18	1,101.51	...	...	294,415.93	47,407.96
I—19 Miscellaneous Debits	1,573.43	73.54	...	...	1,128.81	13,812.07
Total Debits to Income	$173,695.15	$618,377.89	...	...	$850,421.94	$620,997.86
Credit (or Debit) Balances of the Year	2,835,761.35	* 179,320.05	...	...	193,925.32	*83,547.52

Items	Hupeh-Hunan	Ssu-Tao	Kiao-Tsi	Nanchang-Kiukiang	Chinese-Gov't. Rlys.
Accrued Credits to Income					
I—1 Balance, Net Operating Revenue	...	$3,990,472.48	$1,139,352.21	$137,011.27	$27,924,146.31
I—2 Income from Securities	58.50	...	208.00	...	28,553.10
I—3 Interest	513.85	109,884.50	89,260.16	2,383.46	803,562.43
I—4 Profit on Industrial Investments	...	...	...	...	...
I—5 Rents Receivable	42,442.83	21,916.80	53,567.75	17,720.41	512,628.25
I—6 Exchange, Net Credit	859.80	1,355,739.21	119,009.57	13,134.93	1,715,564.49
I—7 Miscellaneous Credits	...	8,822.23	1,224.26	7,294.42	32,442.15
Total Credit to Income	$43,874.98	$5,486,835.22	$1,402,721.95	$177,544.49	$31,016,896.73
Accrued Charges Against Income					
I—8 Balance, Net Operating Loss	914,392.41	...	...	...	1,697,550.81
I—9 Interest on Funded Debt	2,426,966.05	2,336,947.17	2,400,000.00	675.078.14	17,328,486.41
I—10 Interest on Current Debt	96,386.85	...	48,210.00	169,345.20	6,512,248.24
I—11 Contractual Dividends	...	...	...	...	...
I—12 Government Interest	...	...	...	...	517,367.95
I—13 Loss On Industrial Investments	...	...	...	...	7,083.29
I—14 Amortization of Discount on Funded Debt	92,048.88	...	...	...	599,151.41
I—15 Taxes	...	...	...	...	65,675.50
I—16 Rent Payable	...	427,130.69	...	...	1,266,977.74
I—17 Discount on Depreciated Currency	29,012.60	...	505.19	83,049.90	197,597.11
I—18 Exchange, Net Debit	9,995.22	1,747,683.45	162,283.83	27,622.96	3,073,424.70
I—19 Miscellaneous Debits	2,325.79	...	651.69	22,330.96	79,713.26
Total Debits to Income	$3,571,127.80	$4,511,761.31	$2,611,650.71	$979,376.35	$31,345,276.42
Credit (or Debit) Balances of the Year	*3,527,252.82	975,073.91	*1,208,928.76	* 801,931.86	98,253,790.31

(*) Loss or Debit Balance
(1) Under Construction

Table VIII.—Profit and Loss.

Items	*Peping-Hankow*	*Peping-Mukden*	*Tientsin-Pukow*	*Shanghai-Nanking*	*Shanghai H.-N.*	*Peping-Suiyuan*
Credits: —						
Balance for the year	...	$7,855,251.45	...	$1,575,362.32	$1,018,393.42	...
Profit on sale of Assets	...	...	...	...	1,035.62	...
Delayed Operating Credits	$7,885.03	4,767.11	158,140.70	3,525.63	...	2,351.20
Miscellaneous Credits	201,557.19	1,097,391.84	543,279.15	...	...	41,607.44
Total	$209,442.22	$8,957,410.40	$701,419.85	$1,579,087.95	$1,019,429.04	$43,958.64
Debits :—						
Balance for the year	$1,210,129.82	...	$3,811,391.34	...	...	$2,959,745.29
Loss on Property Retired	27,911.00	438.19	...	...	40.00	...
Delayed Operating Debits	5,326.97	40,079.49	50,642.50	2,071,018.58	612,969.35	1,190.00
Miscellaneous Debits	99,273.83	883,480.06	60,600.40	475.20	...	26,954.00
Total	$1,342,641.62	$923,997.74	$3,922,634.24	$2,071,493.78	$613,009.35	$3,987,889.29
Surplus (or Deficit)	*1,133,199.40	8,033,412.66	*3,221,214.39	* 492,405.83	406,419.69	*3,943,930.65

Items	*Cheng-Tai*	*Taokow Chinghua*	*Kaifeng-Honan*	*Lung-Hai*	*Kirin-Changchun*	*Canton-Kowloon*
Credits: —						
Balance for the year	$2,835,761.35	...	...	...	$193,925.32	...
Profit on sale of Assets	...	...	...	...	...	...
Delayed Operating Credits	...	...	...	(1)	...	...
Miscellaneous Credits	750,000.00	5.85	...	...	616.06	4,166.67
Total	$3,585,761.35	5.85	...	...	$194,541.38	$4,166.67
Debits :—						
Balance for the year	...	$179,320.05	...	...	...	$83,547.52
Loss on Property Retired	149.86	...	...	...	...	...
Delayed Operating Debits	...	...	...	...	17.20	...
Miscellaneous Debits	...	11.14	...	...	...	84,497.80
Total	$149.86	$179,331.19	...	...	$17.20	$168,045.32
Surplus (or Deficit)	3,585,611.49	*179,325.34	...	...	194,524.18	*163,878.65

Items	*Hupeh-Hunan*	*Ssu-Tao*	*Kiao-Tsi*	*Nanchang-Kiukiang*	*Chinese Gov't. Rlys.*
Credits :—					
Balance for the year	...	$975,073.91	...	...	$14,453,767.77
Profit on sale of Assets	...	...	...	...	$1,035.62
Delayed Operating Credits	...	...	614.66	...	177,484.33
Miscellaneous Credits	132,151.24	...	32,171.84	...	2,802,947.28
Total	$132,151.24	$975,073.91	$32,786.50	...	$17,435,235.00
Debits :—					
Balance for the year	$3,527,252.82	...	$1,208,928.76	$801,831.86	$14,782,147.46
Loss on Property Retired	...	...	25,863.61	...	54,402.66
Delayed Operating Debits	6,201.51	...	864.79	...	2,788,310.39
Miscellaneous Debits	19,566.35	...	416.19	...	1,175,274.97
Total	$3,553,020.68	...	$1,236,073.35	$801,831.86	$18,800,135.48
Surplus (or Deficit)	*3,420,869.44	975,073.91	*1,203,286.85	*801,831.86	*1,364,900.48

(*) Deficit
(1) Under Construction

Table IX.—Surplus Appropriation Account

Items	*Peping-Hankow* $	*Peping-Mukden* $	*Tientsin-Pukow* $	*Shanghai-Nanking* $	*Shanghai-H.-N.* $	*Peping-Suiyuan* $
S—1 Surplus for the year	..	8,033,412.66	..	..	406,419.69	..
S—2 Surplus from Previous Years (Free)	..	44,426.16	..	*4,621,997.12	638.165.10	..
S—3 Transfer of Government Interest (Omitted)	1,133,199.40	..	..	..	..	†299,792.24
Total Credits	1,133,199.40	8,077,838.82	..	4,621,997.12	1,044,584.79	299,792.24
Deficit carried to Balance Sheet	..	..	4,076,713.17	..	644,786.33	5,330,708.38
Total	1,133,199.40	8,077,838.82	4,076,712.17	4,621,997.12	1,709,371.12	5,630,500.62
S—4 Deficit of the year	1,133,199.40	..	3,221,214.39	492,405.83	..	3,943,930.65
S—5 Deficit from Previous Years	..	..	855,498.78	..	..	..
S—6 Bondholder's share of Surplus	..	..	..	336,714.63	..	..
S—7 Appropriations for Additions to Property	..	2,769,319.47	..	208,704.85	..	(*less*) 27,327.91
S—8 Appropirations for Repayments of Funded Debt	..	710,952.38	..	..	..	..
S—9 Discount Extinguished through Surplus	..	..	..	..	..	..
S—10 Special Appropriations to Funds	..	..	..	..	..	..
S—11 Miscellaneous Appropriations	..	..	..	..	..	..
S—12 Special Remittance to Government (including Transfers of Military Transportation Accounts, etc.)	..	2,462,238.34	..	2,119,362.89	1,709,371.12	1,713,897.88
Total Debits	1,133,199.40	5,942,510.19	4,076,713.17	3,157,188.20	1,709,371.12	5,630,500.62
Surplus Carried to Balance Sheet	..	2,153,328.63	..	1,464,808.92	..	..
Total	1,133,199.40	8,077,838.82	4,076,713.17	4,621,997.12	1,709,371.12	5,630,500.62

*Includes $415,138.88, overstatement of bondholder's share of Surplus in accounts for 1924/5.
†Transfer from B—3—1 to Cover Losses.

TABLE IX.—SURPLUS APPROPRIATION ACCOUNT.—*(Continued)*

Items	*Cheng-Tai*	*Taokow-Chinghua*	*Kaifeng-Honan*	*Lung-Hai*	*Kirin-Changchun*	*Canton Kowloon*
	$	$	$	$	$	$
S—1 Surplus for the year	3,585,611.49	..	*	*	194,524.18	..
S—2 Surplus from Previous Years (Free)	10,248,551.80	..	..	..	219,312.79	..
S—3 Transfer of Government Interest (Omitted)	..	..	..	..	126,717.51	..
Total Credits	13,834,163.29	..	..	..	540,554.48	..
Deficit carried to Balance Sheet	..	1,301,073.95	..	..	..	8,372,647.28
Total	13,834,163.29	1,301,073.95	..	..	540,554.48	8,372,647.28
S—4 Deficit of the year	..	179,325.34	..	..	..	163,878.65
S—5 Deficit from Previous Years	..	1,121,748.61	..	..	..	8,208,768.63
S—6 Bondholder's share of Surplus	..	..	..	..	86,701.48	..
S—7 Appropriations for Additions to Property	671,671.73	..	..	..	312,652.85	..
S—8 Appropriations for Repayments of Funded Debt	950,000.00	..	..	..	..	..
S—9 Discount Extinguished through Surplus	..	..	..	..	..	..
S—10 Special Appropriations to Funds	..	..	..	..	..	..
S—11 Miscellaneous Appropriations	..	..	..	..	..	..
S—12 Special Remittance to Government (including Transfers of Military Transportation Accounts, etc.)	..	..	..	..	40,155.00	..
Total Debits	1,621,671.73	1,301,073.95	..	..	439,509.33	8,372,647.28
Surplus Carried to Balance Sheet	12,212,491.56	..	..	..	101,045.15	..
Total	13,834,163.29	1,301,073.95	..	..	540,554.48	8,372,647.28

Items	*Hupeh-Hunan*	*Ssu-Tao*	*Kiao-Tsi*	*Nanchang-Kiukiang*	*Chinese Govt. Rlys.*
	$	$	$	$	$
S—1 Surplus for the year	..	975,073.91	..	..	13,195,041.93
S—2 Surplus from Previous Years (Free)	..	..	326,668.64	..	16,099,121.61
S—3 Transfer of Government Interest (Omitted)	..	..	..	..	1,559,709.15
Total Credits	..	975,073.91	326,668.64	..	30,853,872.69
Deficit carried to Balance Sheet	13,330,168.32	..	867,618.21	6,574,665.96	40,527,381.60
Total	13,330,168.32	975,073.91	1,203,286.85	6,574,665.96	71,381.254.29
S—4 Deficit of the year	3,420,869.44	..	1,203,286.85	801,831.86	14,559,942.41
S—5 Deficit from Previous Years	9,909,298.88	395,858.24	..	5,772,834.10	26,264,007.24
S—6 Bondholder's Share of Surplus	..	..	..	..	423,416.11
S—7 Appropriations for Additions to Property	..	579,215.67	..	..	4,514,236.66
S—8 Appropriations for Repayments of Funded Debt	..	..	..	..	1,660,952.38
S—9 Discount Extinguished through Surplus	..	..	..	..	..
S—10 Special Appropriations to Funds	..	..	..	..	..
S—11 Miscellaneous Appropriations	..	..	..	..	..
S—12 Special Remittance to Government (including Transfers of Military Transportation Accounts, etc.)	..	..	..	..	8,045,025.23
Total Debits	13,330,168.32	975,073.91	1,203,286.85	6,574,665.96	55,467,580.03
Surplus Carried to Balance Sheet	..	..	..	..	15,913,674.26
Total	13,330,168.32	975,073.91	1,203,286.85	6,574,665.96	71,381,254.29

TABLE X was not provided by the Ministry of Railways

TABLE XI-A.—LIABILITIES OR CREDIT BALANCES (DETAILED BALANCE SHEET)

Heads of Classification	*Peping-Hankow*	*Peping-Mukden*	*Tientsin-Pukow*	*Shanghai-Nanking*	*Shanghai-H.-N.*	*Peping-Suiyuan*
	$	$	$	$	$	$
B—1 Capital Liabilities :—						
B—1—1 Shares	..	..	..	..	..	..
B—1—2 Premium on Shares	..	..	..	..	..	..
B—1—3 Permanent Government Investments	40,369,381.17	23,903,392.57	4,424,824.00	5,686,900.47	17,657,509.75	22,662,737.06
B—1—4 Mortgage Bonds	34,881,679.45	12,440,952.41	74,865,575.65	28,178,309.16	9,792,352.03	..
B—1—5 Other Secured Indebtedness	7,233,298.23	..	9,287,662.21	..	1,374,806.67	7,519,856.69
Total Capital Liabilities	82,484,358.85	36,344,344.98	88,578,061.86	33,865,209.63	28,824,668.45	30,182,593.75
B—2 Working Liabilities :—						
B—2—1 Loans and Bills of Exchange	15,443,830.18	5,566,513.81	5,036,340.30	..	..	11,043,890.48
B—2—2 Traffic Balances Payable						
B—2—2—1 Government Railways	63,834.15	231,178.23	1,174,045.24	56,005.00	20,334.77	1,927,369.09
B—2—2—2 Private Companies	143,641.62	..	..	6,017.99	1,256.50	..
B—2—3 Matured Liabilities Unpaid	9,410,531.71	403,752.41	1,418,268.03	693,578.36	386,699.47	2,470,091.17
B—2—4 Other Accounts Payable						
B—2—4—1 Other Railways	5,274.09	868,860.42	..	28.19	121,878.81	..
B—2—4—2 Sundry Creditors	6,936,259.00	8,340,498.53	7,846,206.40	888,277.71	5,123.25	20,696,684.34
Total Working Liabilities	32,003,370.75	15,410,803.40	15,474,859.97	1,643,907.25	535,292.80	36,138,035.08
B—3 Deferred Credit Items :—						
B—3—1 Temporary Advance from Government	..	..	..	174,482.78	..	..
B—3—2 Operating Reserves	..	..	..	..	..	..
B—3—3 Depreciation Reserves	16,329,002.84	10,874,098.16	6,409,787.53	1,968,149.13	1,527,105.31	4,824,274.40
B—3—4 Liabilities on Account of Provident Funds	..	..	..	..	..	..
B—3—5 Miscellaneous Deferred Credits	4,938,723.14	17,677.34	24,874,021.46	348,020.89	166,767.41	8,013,013.49
Total Deferred Credits	21,267,725.98	10,891,775.50	31,283,808.99	2,490,652.80	1,693,872.72	12,837,287.89

*Under Construction.

TABLE XI.-A.—LIABILITIES OR CREDIT BALANCES (DETAILED BALANCE SHEET).—*(Continued)*

Heads of Classification	*Peping-Hankow*	*Peping-Mukden*	*Tientsin-Pukow*	*Shanghai-Nanking*	*Shanghai-H.-N.*	*Peping-Suiyang*
	$	$	$	$	$	$
B—4 Balance Accumulated Surplus :—						
B—4—1 Additions to Property through Surplus ..	29,104,487.38	51,960,560.20	14,856,359.03	633,678.77	315,417.82	1,011,636.31
B—4—2 Funded Debt Retired through Surplus ..	21,786,107.73	16,894,193.36	11,906,920.64	262,975.27	..	1,892,570.00
B—4—3 Fund Reserves	..	..	..	..	..	..
B—4—4 Free Surplus	..	2,135,328.63	..	1,464,808.92	..	..
Total Accumulated Surplus	50,890,595.11	70,990,082.19	26,763,279.67	2,361,462.96	315,417.82	8,904,206.31
Grand Total	186,646,050.69	133,637,006.07	162,100,010.49	40,361,232.64	31,369,251.79	88,062,123.03

Heads of Classification	*Cheng-Tai*	*Taokow-Chinghua*	*Kaifeng-Honan*	*Lung-Hai*	*Kirin-Changchun*	*Canton Kowloon*
	$	$	$	$	$	$
B—1 Capital Liabilities :—						
B—1—1 Shares	..	..	..	..	813,100.00	..
B—1—2 Premium on Shares	..	..	..	..	..	..
B—1—3 Permanent Government Investments ..	6,331,705.63	4,303,911.87	..	*	421,863.25	3,096,157.58
B—1—4 Mortgage Bonds	6,788,541.66	4,724,733.86	..	..	5,889,016.37	12,226,600.00
B—1—5 Other Secured Indebtedness	..	323,627.37	..	..	..	..
Total Capital Liabilities	13,120,247.29	9,352,273.10	..	..	7,123,979.62	15,322,657.58
B—2 Working Liabilities :—						
B—2—1 Loans and Bills of Exchange	..	..	..	..	..	..
B—2—2 Traffic Balances Payable						
B—2—2—1 Government Railways	37,697.28	291,414.86	..	..	14,847.65	..
B—2—2—2 Private Companies	..	..	..	..	30,074.19	..
B—2—3 Matured Liabilities Unpaid	121,627.54	395,608.41	..	..	236,457.86	93,073.92
B—2—4 Other Accounts Payable :						
B—2—4—1 Other Railways	5,409.80	..	..	..	..	..
B—2—4—2 Sundry Creditors	23,007.67	987.17	..	..	637,997.41	1,126,406.40
Total Working Liabilities	187,742.29	688,010.44	..	..	919,377.11	1,219,480.32
B—3 Deferred Credit Items :—						
B—3—1 Temporary Advance from Government ..	3,570,389.33	1,237,353.31	..	..	..	8,994,831.65
B—3—2 Operating Reserves	..	..	..	..	..	..
B—3—3 Depreciation Reserves	1,835,992.33	781,229.07	..	..	516,184.95	585,069.17
B—3—4 Liabilities on Account of Provident Funds..	..	..	..	..	563.97	..
B—3—5 Miscellaneous Deferred Credits	18,428.29	66,228.88	..	..	62,971.56	18,803.14
Total Deferred Credits	5,524,809.95	2,084,811.26	..	..	579,720.48	9,598,703.96
B—4 Balance Accumulated Surplus :—						
B—4—1 Additions to Property Through Surplus ..	4,605,180.60	..	..	..	2,444,969.57	..
B—4—2 Funded Debt Retired through Surplus ..	7,819,928.43	..	..	..	..	..
B—4—3 Fund	..	..	..	..	..	..
B—4—4 Free Surplus	12,212,491.56	..	..	..	101,045.15	..
Total Accumulated Surplus	24,637,600.59	..	..	..	2,546,014.72	..
Grand Total	43,470,400.12	12,125,094.80	..	..	11,169,091.93	26,140,841.86

Heads of Classification	*Hupeh-Hunan*	*Ssu-Tao*	*Kiao-Tsi*	*Nanchang-Kiukiang*	*Chinese Govt. Rlys.*
	$	$	$	$	$
B—1 Capital Liabilities :—					
B—1—1 Shares	..	..	..	6,306,952.66	7,120,052.66
B—1—2 Premium on Shares	..	..	..	..	..
B—1—3 Permanent Government Investments	3,386,791.64	426,187.50	..	..	32,671,362.49
B—1—4 Mortgage Bonds	51,398,065.79	29,765,384.62	..	10,243,416.56	81,194,527.56
B—1—5 Other Secured Indebtedness	..	..	40,000,000.00	..	65,739,251.17
Total Capital Liabilities	54,784,857.43	30,191,572.12	40,000,000.00	16,550,369.22	486,725,193.88
B—2 Working Liabilities :—					
B—1—1 Loans and Bills of Exchange	..	..	..	2,819,695.69	39,910,270.46
B—2—2 Traffic Balances Payable					
B—2—2—1 Government Railways	..	8,090.96	32,708.54	..	3,857,525.77
B—2—2—2 Private Companies	..	26,914.19	131,343.14	..	339,247.63
B—2—3 Matured Liabilities Unpaid	2,053,341.80	5,040,415.95	2,508,263.14	63,955.55	25,295,665.32
B—2—4 Other Accounts Payable					
B—2—4—1 Other Railways	..	..	..	..	1,001,451.31
B—2—4—2 Sundry Creditors	..	739.14	2,387,381.65	456,003.45	49,345,572.12
Total Working Liabilities	2,053,341.80	5,076,160.24	5,059,696.47	3,339,654.69	119,749,732.61
B—3 Deferred Credit Items :—					
B—3—1 Temporary Advance from Government	16,205,934.49	..	..	..	30,282,991.56
B—3—2 Operating Reserves	..	..	..	..	..
B—3—3 Depreciation Reserves	1,289,926.87	..	2,131,862.47	278,810.43	49,351,492.66
B—3—4 Liabilities on Account of Provident Funds	..	4,152.59	..	..	4,716.56
B—3—5 Miscellaneous Deferred Credits	6,863,458.75	79,023.82	186,544.39	219,594.35	45,873,276.91
Total Deferred Credits	24,359,320.11	83,176.41	2,318,406.86	498,404.78	125,512,477.69
B—4 Balance Accumulated Surplus :—					
B—4—1 Additions to Property through Surplus	..	579,215.67	3,009,048.26	..	14,520,553.61
B—4—2 Funded Debt Retired through Surplus	..	..	..	..	60,562,695.43
B—4—3 Fund Reserves	..	..	..	..	..
B—4—4 Free Surplus	..	..	..	..	15,913,674.26
Total Accumulated Surplus	..	579,215.67	3,009,048.26	..	90,996,923.30
Grand Total	81,197,519.34	35,930,124.44	50,387,151.59	20,388,428.69	822,984,327.48

*Under Construction

Table XI.-B.—Detailed Balance Sheet—Assets or Debit Balances.

Heads of Classification	*Peping-Hankow*	*Peping-Mukden*	*Tientsin-Pukow*	*Shanghai-Nanking*	*Shanghai-H.-N.*	*Peping-Suiyuan*
B—5 Investment Assets	$	$	$	$	$	$
B—5—1 Cost of Road and Equipment	123,634,611.81	106,069,811.25	120,118,576.47	33,581,904.12	24,502,078.43	57,902,324.42
B—5—2 Cost of Other Physical Property	484,151.71	467,730.61	123,770.30	...	3,144,304.66	...
B—5—3 Cost of Non-physical Assets	1,225,350.43	807,002.80	17,788.24	10,578.65	...	76,099.00
Total Investment Assets	125,344,113.95	107,344,544.66	120,260,135.01	33,592,482.77	27,646,383.09	57,978,423.42
B—6 Working Assets	$	$	$	$	$	$
B—6—1 Cash	3,933,709.15	1,607,739.39	825,336.53	842,720.95	127,996.68	988,931.48
B—6—2 Loans and Bill of Exchange	65,000.00	...	...	...	...	...
B—6—3 Traffic Balance Receivable	...	...	...	...	...	...
B—6—3—1 Government Railways	1,934,266.08	...	227,665.27	327.08	433.95	1,644,250.14
B—6—3—2 Private Companies	...	...	...	...	1,439.09	15,464.43
B—6—5—3 Home Line	1,629,497.75	1,366,349.95	531,558.93	130,994.18	76,459.59	368,276.40
B—6—4 Other Accounts Receivable	...	...	...	...	...	...
B—6—4—1 Other Railways	...	50,600.70	...	112,586.03	2,423.30	...
B—6—4—2 Sundry Debits	119,748.21	1,185,546.44	23,074.49	303,589.22	177,968.77	338,812.35
B—6—5 Stores	8,450,798.80	5,246,972.28	5,411,391.64	1,508,738.82	1,283,016.58	1,606,756.72
Total Working Assets	16,193,019.99	9,457,209.28	7,019,026.86	2,898,956.28	1,669,737.96	4,962,491.52
B—7 Deferred Debit Items	$	$	$	$	$	$
B—7—1 Temporary Advances to Government	18,776,756.55	...	23,213,869.13	...	4,687.81	472,620.89
B—7—2 Payments made in advance	209,915.31	...	153,684.28	...	689,719.14	920,680.59
B—7—3 Unextinguished Discount on Funded Debt	2,004,919.46	1,366,200.00	216,475.97	1,314,618.61	685,467.52	...
B—7—4 Abandoned Property Not Charged Off	18,000.00	...	...	...	...	...
B—7—5 Special Funds	7,391,097.87	2,482,257.40	452,500.41	180,000.00	...	448,613.00
B—7—6 Miscellaneous Deferred Debits	16,708,227.56	12,986,794.73	6,707,605.66	2,375,174.98	8,469.94	17,948,585.23
Total Deferred Debits	45,108,916.75	16,835,252.13	30,744,135.45	3,869,793.59	1,388,344.41	19,790,499.71
B—8 Balance, or Accumulated Deficit	...	...	4,076,713.17	...	664,786.33	5,330,708.38
Grand Total	186,646,050.69	133,637,006.07	162,100,110.49	40,361,232.64	31,369,251.79	88,062,123.03

Heads of Classification	*Cheng-Tai*	*Taokow-Chinghua*	*Kaifeng-Honan*	*Lung-Hai*	*Kirin-Changchun*	*Canton Kowloon*
B—5 Investment Assets	$	$	$	$	$	$
B—5—1 Cost of Road and Equipment	25,936,886.23	8,355,071.94	...	(1)	8,976,654.38	15,885,199.27
B—5—2 Cost of Other Physical Property	...	...	...	...	24,387.08	...
B—5—3 Cost of Non-physical Assets	...	...	...	...	40,670.00	...
Total Investment Assets	25,936,886.23	8,355,071.94	...	...	9,041,711.46	15,885,199.27
B—6 Working Assets	$	$	$	$	$	$
B—6—1 Cash	2,423,742.19	177,506.87	...	...	275,988.39	162,600.96
B—6—2 Loans and Bill of Exchange	...	...	...	...	...	...
B—6—3 Traffic Balance Receivable	...	...	...	...	...	...
B—6—3—1 Government Railways	78,198.05	440,775.25	...	...	4,277.60	...
B—6—3—2 Private Companies	...	...	...	...	6,702.82	24,958.30
B—6—3—3 Home Line	89,941.89	409,010.02	...	...	134,950.02	6,675.54
B—6—4 Other Accounts Receivable	...	...	...	...	...	...
B—6—4—1 Other Railways	38,889.58	...	...	...	...	...
B—6—4—2 Sundry Debits	16,495.78	200,347.19	...	...	184,579.54	2,102.49
B—6—5 Stores	2,444,106.54	200,366.88	...	...	476,254.09	290,964.88
Total Working Assets	5,091,374.03	1,428,006.21	...	...	1,082,752.46	487,303.17
B—7 Deferred Debit Items	$	$	$	$	$	$
B—7—1 Temporary Advances to Government	10,240,931.20	...	...	...	113,924.04	902,393.81
B—7—2 Payments made in advance	251,812.16	...	...	...	425,245.94	...
B—7—3 Unextinguished Discount on Funded Debt	678,854.18	14,481.07	...	...	319,945.53	330,000.00
B—7—4 Abandoned Property Not Charged Off	...	...	...	...	...	...
B—7—5 Special Funds	...	32,698.66	...	...	...	...
B—7—6 Miscellaneous Deferred Debits	1,270,542.32	993,762.97	...	...	185,512.50	163,298.33
Total Deferred Debits	12,442,139.86	1,040,942.70	...	...	1,044,628.01	1,395,692.14
B—8 Balance, or Accumulated Deficit	...	1,301,073.95	...	...	...	8,372,647.28
Grand Total	43,470,400.12	12,125,094.80	...	...	11,169,091.93	26,140,841.86

Heads of Classification	*Hupeh-Hunan*	*Ssu-Tao*	*Kiao-Tsi*	*Nanchang-Kiukiang*	*Chinese Gov't. Rlys.*
B—5 Investment Assets	$	$	$	$	$
B—5—1 Cost of Road and Equipment	59,340,071.94	20,330,614.89	39,054,239.35	11,891,535.41	655,579,579.91
B—5—2 Cost of Other Physical Property	...	...	...	...	4,244,344.36
B—5—3 Cost of Non-physical Assets	50,500.00	...	2,300.00	...	2,230,289.12
Total Investment Assets	59,390,571.94	20,330,614.89	39,056,539.35	11,891,535.41	662,054,213.39
B—6 Working	$	$	$	$	$
B—6—1 Cash	508.70	3,447,135.17	1,894,301.97	55,298.87	16,823,517.30
B—6—2 Loans and Bill of Exchange	...	...	...	...	88,902.50
B—6—3 Traffic Balance Receivable	...	...	...	...	...
B—6—3—1 Government Railways	55,645.80	...	102,370.56	...	4,488,209.78

(1) Under Construction

TABLE XI.-B.—DETAILED BALANCE SHEET—ASSETS OR DEBIT BALANCES.—*(Continued)*

Head of Classification	*Hupeh-Hunan*	*Ssu Tao*	*Kiao Tsi*	*Nanchang Kiukiang*	*Chinese Gov't. Rlys.*
	$	$	$	$	$
B—6—3—2 Private Companies	...	678,980.95	431.30	...	727,976.89
B—6—3—3 Home Line	91,245.79	111,600.25	2,132,340.71	6,512.47	7,085,414.49
B—6—4 Other Accounts Receivable	...	...	...	...	...
B—6—4—1 Over Railways	43,241.19	...	395,197.25	1,152.00	644,090.05
B—6—4—2 Sundry Debits	66,201.22	97,383.98	789,983.41	356,857.08	3,862,690.17
B—6—5 Stores	1,186,392.15	1,500,332.16	3,297,884.22	282,408.74	33,186,385.02
Total Working Assets	1,443,234.85	5,835,432.51	8,612,409.42	726,131.66	66,907,186.20
B—7 Deferred Debit Items	$	$	$	$	$
B—7—1 Temporary Advances to Government...	...	8,838,975.80	167,021.83	...	62,731,181.06
B—7—2 Payments made in advance	46,432.72	126,247.02	66,020.22	270,867.72	3,160,625.10
B—7—3 Unextinguished Discount on Funded Debt	2,255,197.56	787,750.00	...	494,231.93	10,468,141.83
B—7—4 Abandoned Property Not Charged Off	...	...	...	...	18,000.00
B—7—5 Special Funds	18,900.00	...	...	...	11,006,067.34
B—7—6 Miscellaneous Deferred Debits	4,713,013.95	11,104.22	1,608,442.56	430,996.01	66,111,530.96
Total Deferred Debits	7,033,544.23	9,764,077.04	1,841,484.61	1,196,095.66	53,495,546.29
B—8 Balance, or Accumulated Deficit	13,330,168.32	...	876,618.21	6,574,665.96	40,527,381.60
Grand Total	81,197,519.34	35,930,124.44	50,387,151.59	20,388,428.69	822,984,327.48

An analysis of the tables, which were so kindly prepared for us by the Ministry of Railways, clearly shows the possibilities of the Chinese Government Railways under expert and unified administration. The difficulty in the past has been that militarists have not only seized the rolling stock of the lines but also their revenues with which they have financed themselves. Freight cars were detained and sold to the highest bidders, while favored transportation companies were permitted to operate without settling their accounts. Mr. Sun Fo has valiantly fought for a demilitarization of the Chinese Government Railways and has at last succeeded in effecting a central administrative control.

According to Minister Sun, the two most serious problems which confronted the Railway Authorities in the past have been, firstly, the heavy financial burdens of the various Railways in meeting the demands of the Military authorities which robbed the various Administrations of practically all of their revenue ; and secondly, the exorbitant miscellaneous levies imposed by the Military authorities upon all freight transported by the Railways which considerably reduced the income from freight transportation.

These two main obstacles to the development of the Railways, however, are being removed by the Central Authorities, and coupled with the centralization of control of all Government Railways, there is good hope that the various Lines will soon be efficiently and profitably maintained. The Ministry is likewise planning to effect repairs to the permanent way and to purchase new rolling stock and other equipment to meet the needs of the various Lines.

He is now engaged in effecting a reorganization of the administration of the railways, particularly as regards the purchasing departments, but he is also planning to liquidate the frozen merchant credits of the various lines. Only by such means will China's credit be restored and sufficient confidence be engendered to make possible the financing of the necessary rehabilitation and constructional plans of the Ministry.

A new chapter in the Government's Railway administration may be said to have been written with the announcement of the coming into force of the Regulations governing the organization of the State Railway Administrations under the Ministry of Railways. The authorities hope that the innovations in the administration of the Government's Railways will not only increase the efficiency of the various Railway Administrations in due course and gradually centralize the control thereof, but also that the various Lines will soon yield sufficient profit to defray their outstanding indebtedness as well as providing for improvements and extensions.

Following is a translation of the new Regulations governing the various State Railway Administrations under the Ministry of Railways :—

Article 1.—All Government Railways shall each be under an Administration in the direct control of the Ministry of Railways ; the names of such Administrations and the various Lines under their respective jurisdiction to be separately regulated.

Article 2.—Each Railway Administration shall be in charge of the traffic, repairs, maintenance, operation, accounting and other related affairs of the whole Line ; and shall also be responsible for the extension or construction of new branch lines which are to be placed under its control.

Article 3.—The Railway Administrations shall be classified into first, second and third grades according to the length of the Lines and the volume of business ; the classification and the number of staff-members to be separately determined.

Article 4.—Each Railway Administration shall have the following departments to take separate charge of the affairs enumerated in Art. 2 :—

(*a*) General Affairs Department.
(*b*) Engineering Department.
(*c*) Traffic Department.
(*d*) Locomotives Department.
(*e*) Accounting Department.
(*f*) Supplies Purchasing Department.

The above-mentioned various Departments may be amalgamated with one another or placed in concurrent charge of the officers of the Administration concerned according to the varying conditions of the Lines.

Whenever necessary, the Administration may establish, upon approval by the Ministry of Railways, branch offices at the more important points along the Line.

Article 5.—Each Railway Administration shall have the following officers :—

(*a*) Managing-Director.
(*b*) Assistant Managing Director.
(*c*) Departmental Directors (Managers) and Assistant Departmental Directors (Assistant Managers).
(*d*) Chief Engineer and Assistant Chief Engineers.
(*e*) Chief Inspectors.
(*f*) Chief Auditors.
(*g*) Assistants (in the various Departments).
(*h*) Secretaries.
(*i*) Sectional Chiefs.
(*j*) Section Managers.
(*k*) Assistant Section Managers.
(*l*) Superintendent of machine shops and works.
(*m*) Director of Railway Hospitals.
(*n*) Sub-Section Superintendents and Assistant Sub-Section Superintendents.
(*o*) Branch Office Managers.
(*p*) Assistant Branch Office Managers.
(*q*) Staff members.
(*r*) Station masters and Assistant Station Masters.
(*s*) Chief Conductors of Trains.
(*t*) Engineers.
(*u*) Technical staff members.

The above-mentioned officers of a Railway Administration may be appointed according to the need of the Line concerned.

For all First-Class Railway Administrations, the Ministry of Railway shall appoint an Assistant Managing Director, a number of Assistant Departmental Directors and Assistant Sectional Chiefs according to the volume of business transacted by the Administration concerned.

For all Second-Class Administrations the Ministry of Railways shall appoint an Assistant Managing Director and a number of Assistant Departmental Directors.

No officials other than those mentioned in the first paragraph of this Article shall be appointed unless with previous special approval from the Ministry of Railways.

Article 6.—The Managing Director of a Railway Administration shall be appointed by the Minister of Railways to manage and administer under the latter's direction all affairs of the entire Line and direct and supervise all subordinate officials.

Article 7.—The Assistant Managing Directors shall be appointed by the Minister of Railways to assist the Managing Directors in administering the affairs of the Line.

Article 8.—The Departmental Directors, Assistant Departmental Directors, Chief Engineer, Assistant Chief Engineers, Chief Inspectors, Chief Auditors, Assistants, Sectional Chiefs, Superintendents of Locomotive Plants, Superintendents of Supplies Stores and the Section Managers of a Railway Administration shall all be appointed by the Minister of Railways to take, under the direction of their respective superior officers, separate charge of the affairs falling under their respective jurisdiction.

Article 9.—The Secretaries of a Railway Administration shall be appointed by the Minister of Railways upon recommendation by the Managing Director concerned to take charge of confidential matters under the direction of their superior officers.

Article 10.—The Sub-Section Engineers, Assistant Sub-Section Engineers, Engineers, Directors of Hospitals, Superintendents of Machine Shops and Works, Managers of Branch Offices, Assistant Sectional Chiefs, Sectional staff members, Technical staff members, Station Masters, Assistant Station Masters and the Chief Conductors of Trains of a Railway Administration shall be all appointed by the Managing Director thereof upon approval and confirmation by the Ministry of Railways to take separate charge of the affairs falling under their respective jurisdiction.

Article 11.—A Railway Administration may employ a number of employees and clerks.

Article 12.—The Regulations Governing the Organization of a particular Railway Administration, the Rules Governing the Administrative Jurisdiction and Powers of the Railway Officials, the Regulations Determining the Official grades and Salary Schedule of all Railway Officers and the Regulations Governing Employment of other Railway Employees and clerks shall all be separately determined.

Article 13.—Unless otherwise specified in other laws, regulations, orders, contracts or agreements, the management of all Government Railways shall conform to the present regulations.

Article 14.—These General Regulations shall become effective on the day of promulgation.

The Engineer as Peacemaker

(Continued from page 435).

The classification of the foreign delegates to the conference and congress in Tokyo is as follows:

Name of Nation	*Num. delegates*	*Guests*
Argentina	1	0
Austria	1	1
Australia	3	3
Burma	1	3
Brazil	1	0
Canada	4	0
China	51	1
Czechoslovakia	3	1
Denmark	9	4
Finland	1	0
France	8	0
Germany	38	12
Britain	35	10
Italy	3	2
Netherland Indies	3	3
Poland	1	0
Philippines	6	1
Straits Settlements	2	0
Sweden	9	5
Russia	9	0
U.S.A.	131	100
Total	311	146
Grand total		457

These are tentative figures, which may be altered by the later report to be made at the opening of the conference.

Book Notes

Pacific Cables and Radio

International Aspects of Electrical Communications in the Pacific Area. By Leslie Bennett Tribolet, Ph.D. Baltimore: The Johns Hopkins Press, 1929.

Cables and radio on the Pacific is an exceedingly important subject, because of the tremendous distances traversed, the high cost of business, the political questions involved and the limitations to profitable operations. The peculiar conditions prevailing in China have, in particular, complicated the procedure and character of this problem.

Dr. Tribolet's book is the most important contribution to this subject. He has brought together all the facts, which he has thoroughly documented. From this standpoint his book is of the utmost importance.

Dr. Tribolet, however, spoils his very fine work by the insertion of extraneous material of doubtful value. For instance, a sentence like this: "But more and more, nations are discovering that propaganda rules the world." What nonsense! What very harmful nonsense! During the war leaders of many countries were seriously affected by the aberration that propaganda could accomplish anything. Since then decent publicists have been fighting this conception, because propaganda has become such a thing of evil, particularly as regards the use of radio for propaganda purposes. President Hoover's repudiation of propagandists in Washington will undoubtedly put a quietus to such a conception of the use of electrical communications for the purveyance of views.

Now, as regards the situation in China, Dr. Tribolet suffers from the very usual and trite suspicions that everything that is done by British or Japanese firms has some hidden, sinister motive. Everything done by Americans is done for business reasons only. The British and Japanese are imperialistic; the Americans never have imperialistic ideas. Thus, the relations of the Great Northern Telegraph Company, the Eastern Extension and the Commercial Pacific have nothing to do with business, with profit-making, but they involve only sinister politics. This type of thinking spoils an otherwise good book, just as the personal reactions of a representative of the Radio Corporation of America—who, I believe, Dr. Tribolet says, had two chins, makes one weep. Why drag it in? Also why drag in (on page 144-145) the rather feeble United Press account of Marshal Chang Tso-lin's attitude toward the South Manchuria Loan? There seems to be something of a *non-sequeter* there. When Dr. Tribolet deals with his subject, he is important and interesting, but when he wanders far afield, he weakens shamefully. He should have been advised by his publisher to omit the useless anecdotes.

In spite of these occasional slips, these Pekin Hotel anecdotes, Dr. Tribolet's volume cannot be disregarded by any student of current politics in Asia.—G.E.S.

Elesco Superheater

An interesting catalogue has reached us entitled: The Elesco Multiple-Loop, Single-Pass Superheater. The introduction reads:

> Outstanding in recent progress in superheater design is the multiple-loop, single-pass arrangement—an exclusive Elesco development—which provides greater uniformity and the higher superheat demanded by modern practice.
>
> In its application its unusual flexibility permits location within the boiler setting to best advantage. For the highest superheats, the units often are within the hottest gas zones. Ample protection is always provided through location of those units which are exposed to the severest heat, between or otherwise close to water tubes.
>
> In Elesco superheaters for H.R.T. boilers and Elesco radiant superheaters it has been found that sufficient superheat may be obtained with single-loop, single-pass superheaters. Otherwise all Elesco superheaters follow the same general Elesco principles.
>
> Typical adaptations to all types of boilers are shown herein.

Copies of this Bulletin, T-19, may be obtained from the Superheater Company. 17 East 42nd Street, New York.

(Continued on page 466).

The World Power Conference at Tokyo

By NEWTON W. EDGERS

IN connection with and at the same time that the World Engineering Congress is held in Tokyo during the latter part of October and the first of November there will be a sectional meeting of the World Power Conference. The importance of this conference is world wide and a large number of the leading men who are interested in the various branches of industry and science which come under this heading have signified their intentions of being present for the gathering in Japan. Not only will this conference act as a clearing house for a thorough interchange of ideas, technical developments and practical economics of subjects in connection with the problems of international but as well as national development of power resources, power in transportation, power projects, increased efficiency in general, and transmission and their allied topics.

Previous to the organization of the World Power Conference there was little interchange of ideas between isolated countries, but since the first conference held in Great Britain in the autumn of 1924 such fences have been removed and the free flow of information has increased and been kept up by the three meetings held since that time.

The meeting in Tokyo is expected to be by far the most important of the gatherings which have been held since the conferences were initiated, and the Japanese engineers as well as the country in general are preparing to give of their best in order to make the meeting a most complete success. It has been realized by the Japanese hosts to the foreign delegates that there are two phases and two different reasons for their coming to Japan. One lies on the purely practical side concerned only with the engineering problems of power in general while the other, though unofficial, that of sightseeing excursions and entertainment will play a great part in the programs this fall. In regard to the former there will be a number of important papers on engineering subjects which will be delivered at the meeting. There will also be open discussion on pertinent subjects as well as arrangements for future meetings of the conference.

H.I.H. Prince Chichibu, Patron of the World Engineering Congress and the World Power Conference

The conference in Tokyo has been specifically arranged and papers to be submitted are to deal with the economic aspects of the subjects ; particularly in view of the fact that the World Engineering Congress will be in Tokyo at the same time, making it preferable that purely technical problems be dealt with in papers to be presented before the Congress.

The general technical program of the conference has been divided into seven sections, which are as follows :

Section A.—National and International Development of Power Resources.
Section B.—Rational Unification and Economical Administration of Electric Power Development.
Section C.—Economic Future of Power for Use in Transportation.
Section D.—Better Efficiency in Power Production.
Section E.—Distribution of Fuel and Power.
Section F.—Smoke Abatement in Cities.

This follows the general outline of the objects of the World Power Conference which have been set forth at previous meetings and are to the effect that the organization is in existence to consider how the industry and scientific resources of power may be adjusted nationally and internationally through the following methods :

By considering the potential resources of each country in hydro-electric power, oil, and minerals.

By comparing experiences in the development of scientific agriculture, irrigation, and transportation by land, air, and water.

By conferences of civil, electrical, mechanical, marine and mining Engineers, Technical Experts, and authorities on Scientific and Industrial Research.

By consultations of the Consumers of Power and the Manufacturers of the Instruments of Production.

By conferences on Technical Education to review the educational methods in different countries, and to consider means by which the existing facilities may be improved.

By discussions on the financial and economic aspects of industry, nationally and internationally.

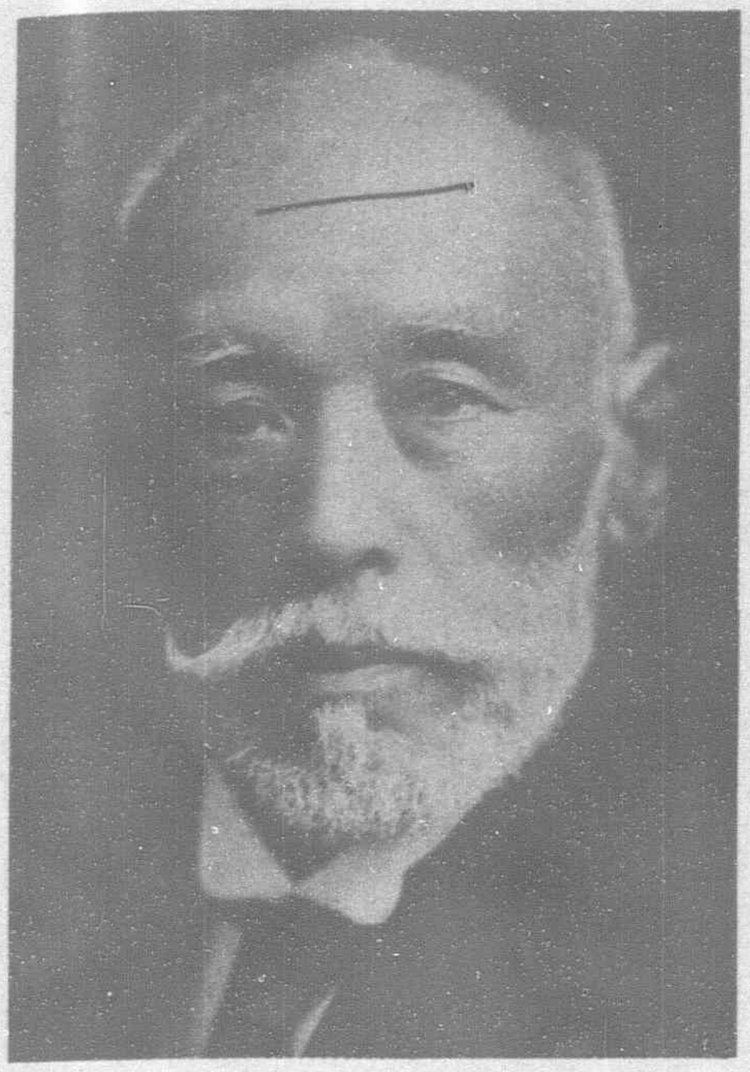
By conferences on the possibility of establishing a Permanent World Bureau for the collection of data, the preparation of Inventories of The World's Resources, and the exchange of industrial and scientific information through appointed representatives in the various countries.

Already a number of interesting papers have been submitted for presentation to the Congress. Under section C. there is a paper by Dr. Henry Zoelly, the president of Escher Wyss and Co., Zurich, on his famous invention of the Zoelly steam turbo-locomotive. While Dr. Zoelly has given his paper the title of " The Zoelly Steam Turbine Locomotive with Special Reference to High Pressure Steam Turbines," it can be divided into two parts, one dealing with turbo-locomotive power, and the other with the first 1,400 and 2,500 lbs/sq. in., high-pressure steam turbines built by Escher Wyss and Co. for Siemens-Schuckertwerke in Berlin, to be installed in connection with an experimental Benson boiler in their power station.

Regarding the turbo-locomotive, Dr. Zoelly places special emphasis on its features distinct from ordinary reciprocating engines. It is stated that the condensing turbine, quite apart from the large saving in coal, allows of the full expansion and utilization of the steam up to high vacuum within a small space, and supplies an oil-free condensate, containing no scale-producing constituents, whereby the boiler corrosion is reduced. This alone can be considered an improvement of the steam locomotive. Again steam turbine drive through a reduction gear is an excellent locomotive prime mover which fully satisfies the technical requirements of railway service and is capable of much greater tractive effort than the reciprocating engine when starting owing to its uniform torque.

Dr. Zoelly then describes the first Zoelly turbo-locomotive installed in the Swiss 1-C reciprocating locomotive, retaining the boiler and wheel mounts ; further the 2-C-1 Krupp turbo-locomotive which has a normal rating of about 2,000 HP ; the turbo-locomotive of 22 atmospheres gauge pressure and 3,000 effective HP, and finally a high pressure Schmidt-Henschel piston locomotive, with details of the gradual improvements made at every stage. He also mentions the continual trial runs made on the Berlin-Magdeburg line for determining steam and coal consumption of the locomotives per HP/h at the drawbar, and finally arrives at the conclusion that the economy of low pressure turbine locomotives is remarkable and reaches 40 per cent. as an average, better than the consumption of the ordinary super-heated steam locomotive at all loads. Dr. Zoelly further says that by means of an improved type of cooling equipment a better vacuum with less power consumption of the auxiliaries can be obtained. This reduction in power consumption of auxiliaries will result in better steam consumptions, especially at partial load, and a very flat steam consumption—drawbar load curves will be obtained, which up to now has not been considered possible.

In the diagrams accompanying the paper, Dr. Zoelly has shown by curves that the high pressure turbo-locomotive of 22 atmospheres gauge pressure, 2,000 eff. HP and of 3,000 eff. HP, both being of a projected new design have a flatter characteristic and will result in economies of 48-50 per cent. at full load and 61-64 per cent. at partial loads.



Baron Koi Funichi, President of the Tokyo Sectional Meeting

Mr. Keizaburo Hoshimoto, Chairman of the Technical Committee and President of the Japan Oil Company

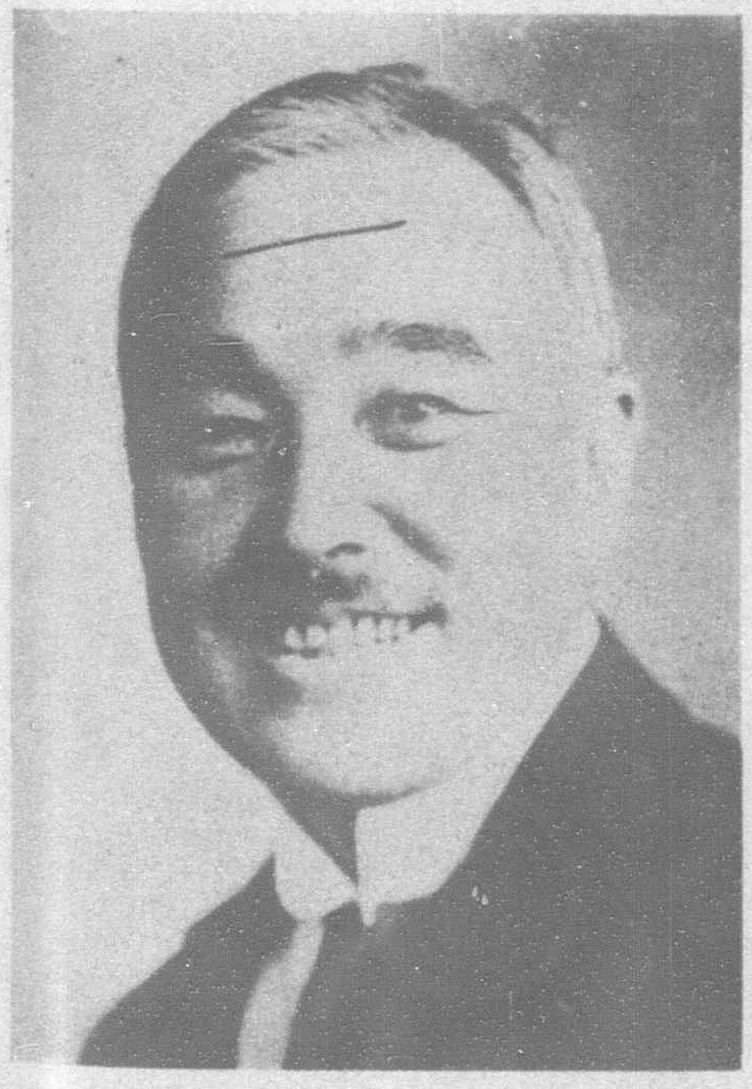
Dr. Maso Kamo, Chairman of the Japanese National Committee of the World Power Conference

It cannot be denied that the trend of the present day is to increase steam pressure, aiming at economy in railway service, and eventually, the turbo-locomotive will be introduced in Japan. Dr. Zoelly does not stop with improving and effecting economy in railway service with his steam turbine, but extends the field of its application to steam-driven prime movers on board ship or on land.

He exemplifies this more or less newer application by his contribution entitled, "The first 1,400 and 2,500 lbs/sq. in. high-pressure steam turbine built by Escher Wyss and Co.," prepared by Mr. F. Flatt. This paper treats, at first, the pure back pressure steam turbine of 1,400 lbs/sq. in. pressure at 750 degrees F. to serve as a primary turbine for the existing condensing turbines in connection with an experimental Benson Boiler, oil fired, in the power station of the firm of Siemes-Schuckertwerke in Berlin.

The special features of the pure back pressure steam turbine are the turbine casing specially made solid of forged steel for the strain of such high pressure, length of blades made as long as possible, and 9 impulse stages altogether, at a speed of 10,000 r.p.m. generating power on an output of 1,200 HP. Then the author describes another high-pressure turbine with a pressure of 2,500 lbs/sq. in. projected for the second Benson boiler plant of the same firm, which boiler is fired with pulverized coal, producing steam at 3,200 lbs/sq. in. measured at the moment after leaving the boiler. The exhaust steam of high pressure turbine is utilized for heating some cable works. The turbine has an output of 3,750 HP. measured at the generator. The details are made plain by the aid of photographs.

There has also been submitted to the Power Conference an important paper by an authority on the diesel engine, Mr. H. H. Blache. The title of this treatsie is, "On Propulsive Machinery for Ships with Special Regard to the Development of Marine Diesel Engines."



Mr. Chukuro Kadono, Chairman of the Reception Committee and Managing Director of Okura & Company

Mr. Yasuzuenion Matsunaga, Chairman of the Conference Committee and President of the Toho Electric Power Company

Mr. Tojiro Kurahashi, Managing Director of the Association for the Promotion of Industry

The paper opens with a short historical sketch of the century from 1807 to about 1907 during which time the marine engine developed into a standard type, the triple expansion engine, with Scotch boilers and saturated steam, then touches on a similar development of the steam turbine, commencing in 1897 when the *Rurbinia* amazed the world at the Naval review which took place in honor of Queen Victoria's Diamond Jubilee, culminating in 1907 with the construction of the *Mauretania* and the *Lusitania*, both steamships then known to be the World's fastest passenger liners. He then goes on to point out the comparatively slow advancement of the marine Diesel Engine, in spite of its increasing use for propulsion of ships during the past 18 years, and of numerous factors which tend to assist that development. The benefit that could be derived from the technical and practical experiences gained in the manufacture of the two previously mentioned types of engines, besides the experience derived from the construction of stationary Diesel plants which have been in use for at least 20 years is brought out.

Mr. Blache continues that while technical diversion between the two main types of steam engine, *i.e.* reaction and impulse led to the adoption of a nearly uniform type of turbine a similar compromise has not as yet arrived between four stroke and two stroke Diesel engines, in which respect the author brought in the figures of sea-going motor ships of over 2,000 tons gross equipped with four stroke engines and which were compiled from *Lloyd's Daily Index* dated April 30, 1929.

Burmeister & Wain Type 381 ships 2,340,086 tons. Total of other types 141 ships 832,696 tons.

The following difficulties are mentioned in the paper to be encountered in the design and construction of the two-stroke marine engine, and acknowledging these difficulties Burmeister & Wain, Ltd. of which the author is Managing Director, have for may years refrained from bringing a two-stroke engine into the market :

1.—The heat stresses of the cylinder covers, liners and pistons being high.

2.—The wear on the cylinder liners being large owing to the fact that there is compression and combustion pressure on the piston rings in the upper period of each stroke, which makes the distribution of the lubricating oil film difficult on the upper surface of the cylinder liner which is subject to most wear.

Mr. Kukugoro Inouye, Managing Director of the Electrical Association of Japan

3.—Ineffective scavenging of the cylinder with fresh, cold air, whereby combustion with a suitably low temperature cannot be obtained, uninfluenced by the remaining gases of high temperature.

4.—Large cylinder oil consumption, owing to the lubricating oil which is adhering to the scraping edges of the piston rings being scraped off or blown away in passing the exhaust opening.

5.—Scavenging pumps of the piston type for supplying the total quantity of air to all the cylinders require dimensions which are such that over all length of the engines will be very great and increase the initial costs considerably.

6.—With regard to lubrication of single acting engines, special measures are required particularly for the crosshead brasses due to the fact that all bearings are only subjected to pressure in one direction.

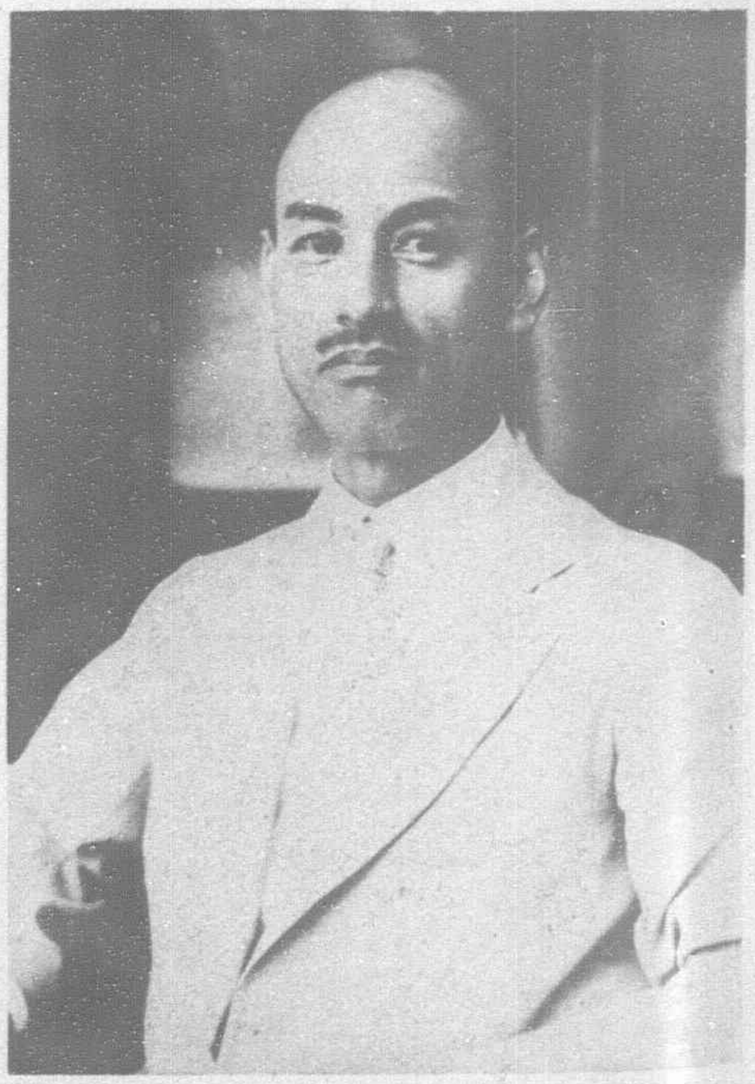
Medal to be Presented to all Delegates of the Tokyo Sectional Meeting of the World Power Conference

Finally Mr. Blache took pains in describing every detail of the important features in the design of The Bow Two-Stroke Double Acting Engine, based on the double acting Diesel engine of the two-stroke cycle principle for propulsion of large ocean-going ships as designed by Burmeister & Wain said to be the latest type of two-stroke engine on the market, resembling closely the firm's type of four-stroke double acting engine, embodying the important features in the design. The author exemplifies its advantages by giving details of a vessel built to the order of the East Asiatic Co., Ltd., Copenhagen, single screw and fitted with Burmeister & Wain two-stroke double acting Diesel engine, having cylinders, 620 mm diameter by 1,400 mm stroke, airless injection, normal load at sea being 7,000 B.H.P. when running at 100 revs. per minute Pi 7.2 Kg/cm² mechanical efficiency 0.85 and speed, loaded, 15 knots in fine weather. Then comes the advantages of the small single acting airless injection type of Burmeister & Wain two-stroke engine as used in connection with fishing craft.

He touches on the fact that utilization of the Lenz engine is a sign of the significance of modern centralization, this type of engine being designed by Prof. Lenz of Berlin and used popularly in small Scandinavian ship trade on the North Sea and Baltic. The Reciprocating engine equipped with L.P. turbine coupled to the engine shaft by means of geared wheels, is brought out in the paper.

Modern high temperature and high pressure turbines have given rise to the necessity for more research into the behavior of metals under high temperatures. One of the best research engineers on this subject has consented to give the results of some of his recent work to the Tokyo gathering. This information is contained in a paper prepared by Mr. R. W. Bailey, mechanical engineer of the Metropolitan-Vickers Electric Co., Ltd., Trafford Place, Manchester, and a member of the Institute of Mechanical Engineers, bearing the title of "Creep of Steel Under Simple and Compound Stresses and the use of High Initial Temperature in Steam Power Plants," which may be considered as one of the most important and valuable contributions ever presented at the Conferences. As is mentioned in the foreword written by Mr. K. Baumann, Chief Mechanical Engineer of the Company, the object of this paper is to stimulate the interest of Engineers in the subject matter of the paper, and to promote research urgently needed to place our knowledge of the behavior of metals at elevated temperatures upon a technical basis as sound as in the case of metals at atmospheric temperature.

It is mentioned in the paper that the most refined data ever published corresponds with a creep rate of the order 10^{6} strain per hour, *i.e.*, an elongation of one millionth of the lead piece per hour. The author goes on to emphasize the practical importance of strain rate of 10^{8} per hour



Mr. Shiro Nakanishi, General Secretary

in view of a creep rate of 10^8, *i.e.*, one hundred millionth of that magnitude having occurred in a bolt holding a joint against steam pressure, consequently, lengthening the bolt in a periodo f two years by an amount equal to its elastic strain and, thereby, resulting in leakage in a shorter period.

The Metropolitan Vickers Electric Company is mentioned as having recently been successful in measuring a creep rate of 10^8 per hour, by putting into operation specially devised apparatus intended to measure creep rate of this amount and overcoming the difficulty of controlling temperature. The author, then touches on successful tests accomplished in obtaining data of the initial and final conditions of metals to determine changes, other than dimension, being in progress, and bringing out the evidence of spheroidization of cementite. Mr. Bailey goes into his elaborate creep tests done later at 450 degrees and 500 degrees upon 0.90 per cent. carbon steel (*i.e.* pearlite composition) with the cementite in both the lamellar and fully spherodized condition to find a reduction of the stress of approximately 25 per cent.

The author suggests, therefore, that for high temperature service super-heater tubes and steam pipes should be fully annealed after final drawing and rolling. The author dwelling upon creep under compound stress, gives, in detail, tests done on and the results obtained of steel tubes placed under both tension and torsion producing equal maximum shear stresses, and, on experiments upon lead pipe under internal pressure and superimposed axial load. Mr. Bailey finally comes to conclusions which have come out of his careful analysis of the materials used in his tests and experiments, and goes back, stage by stage, through the progress of the work.

There are a number of important papers contributed by Japanese authors which offer a rare opportunity to obtain a comprehensive understanding of the past and present status of electric enterprise in Japan in all its aspects, legal, economic, and technical. The paper entitled, " Gas and Electric Supply and Consumption for Domestic Use in Tokyo " by Mr. Koji Goto, Secretary of the Tokyo Institute for Municipal Research, explains in detail, with the aid of statistical data, the rapid increase in the number of incandescent lamps installed in homes since the first installation in November 1907 by the Tokyo Electric Light Company in the city of Tokyo.

At the end of 1927, the total number of homes using electric lights was 10,547,235, in Japan, excluding Korea, Formosa and Saghalien, which represents 88 per cent. of the total number of homes and showing an increase of 4 per cent. annually. The average number of lamps for each home was 3.1 and the average candle power 57.4, which corresponds to 69.7 watts. Japan then ranked first in the world in the ratio of the number of homes using electric lamps to the total number of homes.

This paper takes up rates in Tokyo under two classifications, a flat rate which is based on candle power of a lamp charged according to the number of lamps in a home, and the other method by meter which represents charges on actual monthly consumption of electric power as registered by meter installed in a home in which the greater the consumption over the above the minimum charge the lower the rate per kwh.

The author gives out the figure of 10,558,800,000 kwh. as the total amount of electric power generated in Japan in 1927, five times what it was ten years ago and amounting to 172 kwh per capita. In the city of Tokyo, at the end of the year 1927, the number of homes using electric lights was 378,321, of which figure there were 154,814 homes, or 41 per cent. each using one or two electric lamps on a flat rate and 166,942 homes, or 44 per cent. using more than five lamps.

The author goes on to give the figure of 3,048 homes as using electricity for heating purposes, total kilowatts being 7,784 which indicates 2.5 kw per month per home. Lighting and heating expenses as items of household expenditure throughout Japan according to figures from the statistics for one year ending August 1927, basing the statistics on the average income of 1,575 salaried men and 3,210 manual laborers shows that lighting and heating expense is Y.5.66 against a total monthly expenditure for salaried men of Y.86.29, and Y.4.17 and Y.66.79 for manual laborers. These figures indicate that lighting and heating expense increases according to increase in income which means improved living conditions.

Another valuable contribution has been made by another member of the same institution, the Tokyo Institute for Municipal Research, Mr. K. Ogura, under the subject of " The general state of Municipal Electric and Gas Undertaking in Japan." The author treats the origin and history of municipal undertakings in tramway, electric and gas supply, by the aid of numerous tables from which we learn that the first business started in Japan for tramways was by a private company in the city of Kyoto followed by similar enterprises in Osaka and Tokyo, Osaka preceding Tokyo by a few months. The latter was operated by the Tokyo Street Railway Company until 1911, when the tramway was bought by the Tokyo Municipality under which ownership and management the tramway has continued to operate. The Osaka Municipal tramway has continuously been under the same ownership and management.

In 1917 the total number of consumers and installations of incandescent electric lamps using electric power supplied by Municipal undertakings was 4,243,430 consumers and 10,317,303 lamps and in the year 1927 increased to 10,547,235 and 32,322,991 with a revenue therefrom in the same year of Y.244,678,131. Practically all of the municipal electrical undertakings are financed by bonds, or in isolated cases, by loan. At the end of the fiscal year, 1927, the total amount of the municipal bonds issued for the purpose and that outstanding of the City of Tokyo was Y.278,918,019.78 and Y.218,660,611.11 respectively, and that of City of Osaka, Y.183,572,700 and Y.171,830,751 respectively.

In the loans raised and outstanding of the City of Tokyo are included bonds issued in pounds sterling, French francs and dollars, representing £6,807,900, Frs. 100,880,000 and $4,696,000 for the former and £5,694,200, Frs. 83,935,000 and $4,642,078 for the latter. In the statement of electrical undertakings of Tokyo Municipality, the property listed is valued at Y.254,819,127, revenue Y.43,016,-555, expenditure Y.28,743,040, profit Y.14,273,515, the last item showing a return on fixed capital of 5.6 per cent. at the end of fiscal year of 1927.

The largest net return on fixed capital from municipal electrical undertakings was 14.8 per cent. for Kyoto, the second, 12.8 per cent. for Sendai, while the cities of Toyama and Sapporo showed deficiencies of 0.23 per cent. and 0.18 per cent. respectively.

After all these statistics the author goes into the question of a fair return on property and of distribution of net surplus. In his opinion, net surplus obtained after deducting sinking funds should be appropriated for rate reduction, betterment of service and for promotion of social welfare work.

It is brought out by the author that during the last few years much has been done in scientific research into city administration, particularly with reference to public utilities within the limit of cities and its relation to the public interest, with a suggestion to establish an institution or commission, as it may be called, to function as an authoritative body in matters concerning supervision of public utilities.

The paper entitled " Compensation Contract for Electric Enterprises in Japan," prepared by the Electric Research Department of Toho Electric Company and that prepared by Mr. W. H. Blood on " The Present Status of Public Utility Regulation," when placed side by side, give an impression that they are not in the least related to each other, but on closer examination of their contents, they reveal a striking similarity. The former treats, in the main, the present status of Japanese laws and regulations of electrical enterprises with special reference to compensation contracts between local self-governing bodies, and electric enterprises, and touches on authorization and enforcement which are from two sources, one originating in the laws which are administered through the government by prefectural governors, mayors of cities and town and village authorities; and the other from the compensation contract which specifies self-governing bodies.

In Japan, therefore, independent bodies are very much restricted by the government laws in their ability to function regarding electric undertakings.

The paper prepared by Mr. W. H. Blood, while, treating a similar subject, as its title implies, shows most comprehensively what was brought out by a few passages in the inaugural speech delivered by President Hoover on March 4, 1929, these passages being quoted in his paper as follows. " Regulation of private enterprise and not government ownership or operation is the course rightly to be pursued in our relation to business. Confer monopoly by limiting competition—we must regulate their services and rates."

In the author's opinion in the United States of America, regulation of public utilities is an accomplished fact which does

(Continued on page 454).

Development of Aeronautics in the Far East

An attempt is made in this article to bring the Aeronautical situation in the Far East up-to-date. Developments, however, are so rapid that there can be no certainty that all items are included.—Editor.

YIELDING to aviation with tremendous enthusiasm, China possesses a number of good aviators and qualified mechanics and even some technical engineers trained in Britain, America or in France, but for everything connected with material, she is completely dependent on foreign countries.

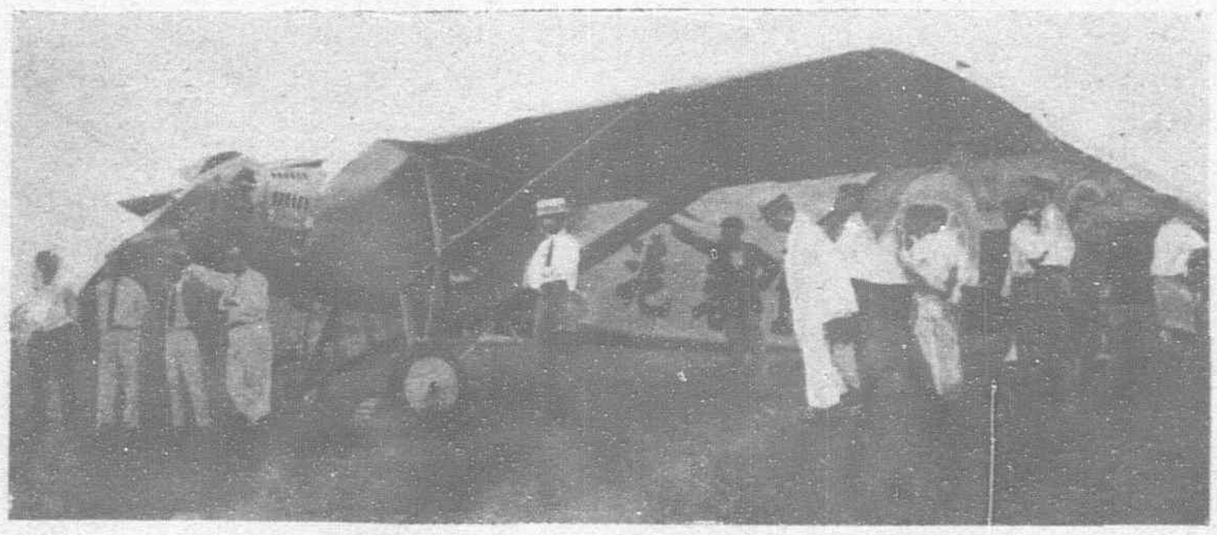
A meeting took place in Nanking of the representatives of the Ministries of Communication, of War, of Industry, Commerce and Public Works, and Finance, with the object of discussing the projected organization of a Sino-German Society of Aviation. An agent of the Lufthansa took part in the deliberations. The proposition of the German representative included a service of passengers and mails between Nanking and Berlin, *via* Chengtu, Peping and Moscow.

The British hope to make Hongkong an air-base of the first importance, with control of air navigation in the China Seas. In spite of its privileged position this effort has not been altogether successful. Captain Vaughan-Fowler, director of the aerodrome at Kai-tak, has been particularly active in the development of aeronautics in South China.

Amoy has already proceeded with the opening of an aviation center and will soon open a school for pilots. This enterprise was decided upon by Admiral Lin Kuo-kong, who desired, since the Chinese Navy was stationed at Amoy, to supply this island base with a squadron of hydroplanes. Mr. Tcheng Kuo-liang conceived the idea of opening an Aviation School at Fukien, with the help of wealthy Chinese of this province, and from Manila and Detroit. An important group of his fellow countrymen, having promised Mr. Tcheng their help and having even bought for the projected school five Curtiss 150-H.P. biplanes, he engaged a Chinese adviser, born in the Philippines, who had an American diploma of aviation.

Mr. Tcheng, on a site at the northwest of the Island of Amoy at Co-Tong, constructed a hydroplane station, in proximity of a motor road 20 kilometers long leading to Amoy. The authorities provided for the construction of the building with only a brief delay before the arrival of the expected Curtiss machines. The Chinese navy again considered the question of the acquisition of two hydroplanes which were to be maintained from its budget. The pilots were to receive their training free in the machines of Mr. Tcheng's school, which would comprise 20 pupils from the Philippines and 20 from the province of Fukien.

At Hankow the Association for the Advancement of Commercial Aviation was organized at the beginning of last October, upon the initiative of the Central Bureau of Aviation of the Fourth Army Group. The Canton Government received from the United States at the end of last year a machine of the type of the "Pride of Detroit," with a Ryan motor, accommodating four passengers and two pilots. Several additional machines of this type were purchased. The machines were successfully assembled at Canton by Chinese mechanics on the aviation ground. Last December they even carried out bombing exercises with a squadron composed of four or five Briguet machines of Type No. 14. The machines are furnished with Lance bombs of European origin, which function perfectly.



Shanghai-Nanking Mail Service of the Ministry of Communications

It was with the help of a machine bought in America for $30,000 that Major-General Chang Wei-chang, director of aeronautics at Canton, made journeys from Canton to Hankow in six hours and from Hankow to Nanking in about four hours. On his arrival in the new Chinese capital the Nationalist Government and the people gave him an enthusiastic welcome. The aeroplane, christened "Canton," resembles the type used by Lindbergh, on his trans-Atlantic flight. The Cantonese aviator continued his journey as far as Peping and Mukden and returned to Canton *via* Shanghai. Since his return an aviator from the Cantonese Flying Corps flew a hydroplane, christened "Chu-Kiang" (Pearl River), on the second long-distance flight from Canton northwards.

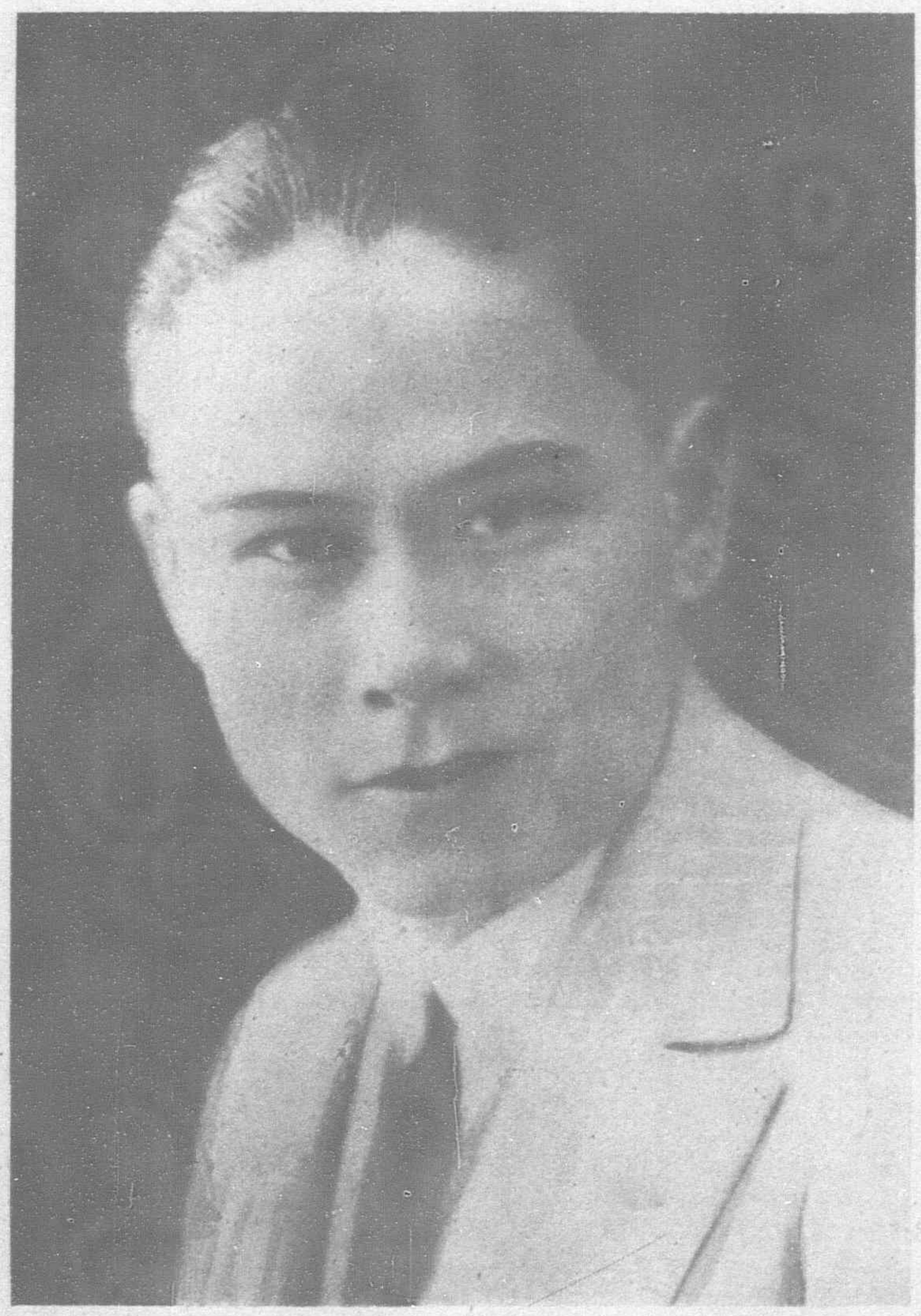


Photo by Powkee & Sons

General Chang Wei-chang, the "Lindbergh" of China

Sponsored by the Government, flying enthusiasts are engaging in the manufacture of planes in China. Already seven Chinese-made air craft have made their appearance. There are three plane factories in China, one in Canton, one in Shanghai and another at Pagoda Anchorage in Fukien. The parts, the wings and the body of the plane are all made in China, except the motor which has to be imported.

The Chinese Aeronautical Association came into being on August 1, 1928. It has considered five main air lines. They are (1) the Shanghai-Hankow line (2) the Canton-Shanghai Line (3) the Canton-Hankow-Szechuen line (4) the Peping-Hankow line (5) the Peping-Shanghai line. The first three lines have been planned and decided upon and actual work will soon be started.

The Ministry of Communications has also a scheme for air

routes, which will be laid out with the Capital as the center. The Shanghai-Nanking Air Mail Service under the Ministry of Communications actually inaugurated on July 8, 1929, in which Stimson-Detroit planes are used.

On April 17, 1929, the Chinese Government, represented by the China National Aviation Corporation, of which Mr. Sun Fo, Minister of Railways, is President, signed contracts with Aviation Exploration, Incorporated, a subsidiary of the Curtiss group of aeronautical companies in the United States, granting to the American company, or an operating company to be subsequently formed, exclusive franchises to operate air-mail services on three routes, a minimum flying mileage of three thousand miles a day being guaranteed. China Airways Federal Incorporated, U. S. A., was formed as an operating company and the first route from Shanghai to Hankow *via* Nanking and Kiukiang was inaugurated on October 21, 1929. The other two routes, one being from Hankow to Canton *via* Changsha, or an alternative route to be agreed upon, and the other from Nanking to Peping *via* Tientsin,—are to be started on January 17, 1930.

The China National Aviation Corporation is a Chinese Government owned corporation, analagous to the United States Shipping Board or Merchant Fleet Corporation. The contracts were confirmed by Mandate of the State Council of the Chinese National Government. The franchises are exclusive only with respect to the carrying of air-mail over the routes, but the China National Aviation Corporation may carry passengers and express in addition to the air-mail in competition with any other companies.

This contract was published in the May, 1929, issue of "The Far Eastern Review."

Sun Fo, Minister of Railways and President of the National Aviation Corporation

Japan

In flying, as in all other activities Japan plans the creation of commercial and postal air lines, both metropolitan and further afield. In contradistinction to the methods adopted by Siam and China, she intends to force success with her own means and with the help of engines of national manufacture.

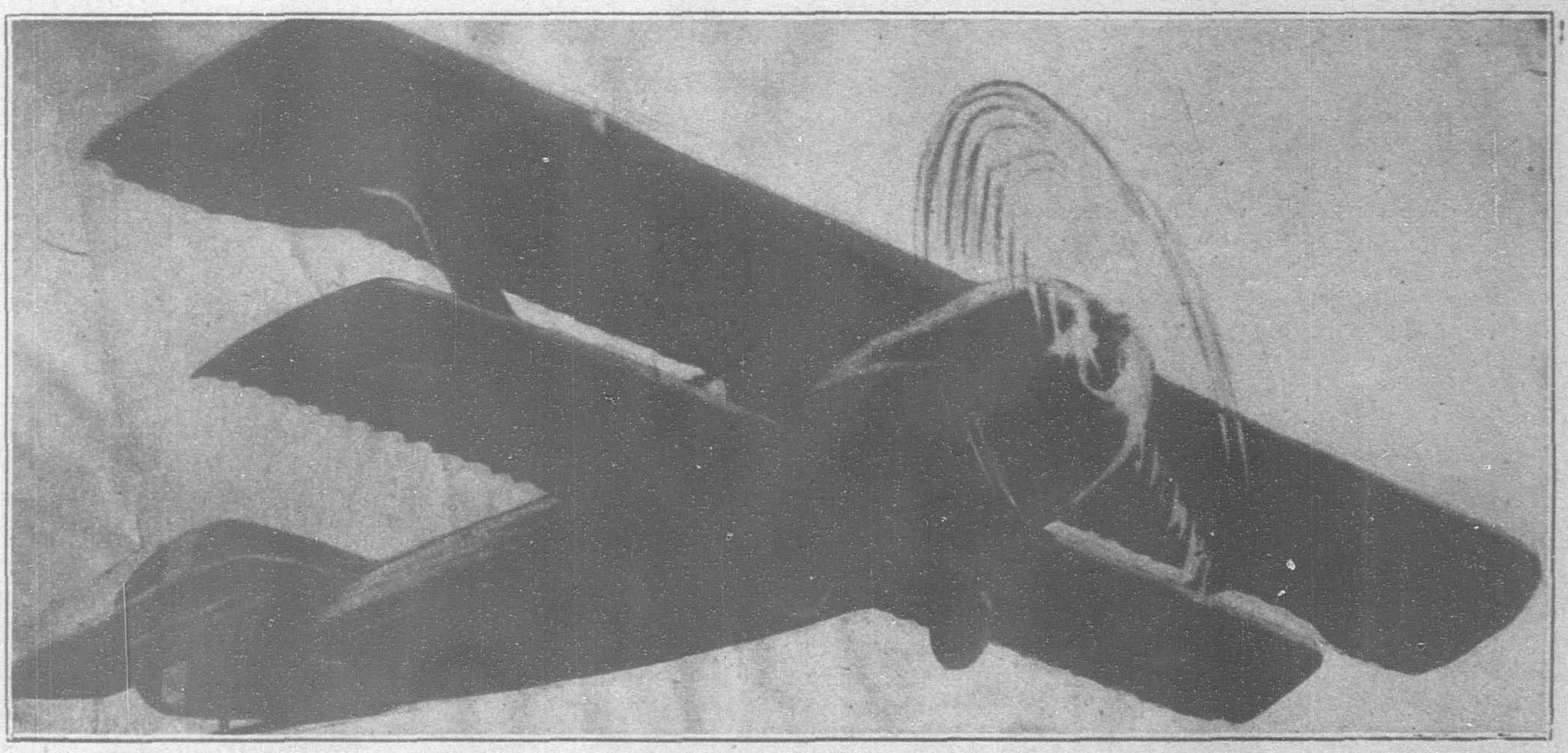
The vote of the Imperial Diet of a subsidy of Y.20,000,000 permitted the constitutional beginning on July 20, 1928, of a Japanese Aerial Transport Company under the title Nippon Koku Kabushiki Kaisha. This Society was authorized to issue 20,000 shares of Y.50 each. The management of this company are financiers of the first importance, such as Mr. Inouye, the incumbent Minister of Finance and Mr. Modokoro, former financial director of the Ministry of Communications. In the interests of National Defence the Imperial Government stipulated as one of the conditions of the subsidy that foreigners should not become shareholders. According to Mr. Torizo Yanagiya, Director of the Company which is now in its second year, has outlined its program as follows :—

(1) In the first fiscal year (1928) a corporation shall be established with a capital of Y.10,000,000 for carrying out the transportation of passengers, freight and mail by aeroplane and in the second fiscal year the regular aerial service shall be commenced.

(2) The regular routes of the new Company shall be Tokyo-Dairen and Osaka-Shanghai.

(*a*) The Tokyo-Dairen Route shall take Tokyo as its starting-point, Osaka, Fukuoka and Seoul as calling places, and Dairen as the terminal.

(*b*) The starting-point of the Osaka-Shanghai Route shall be Osaka and the terminal Shanghai, which shall be reached *via* Fukuoka.



The Machines employed in the "Asahi" Tokyo-Europe Flight are Two Breguets, capable of an Average Speed of 180 Kilometers an Hour

(3) The following services shall be executed by the Company:—

(*a*) The Tokyo-Dairen Route.

	2nd Year	*3rd Year and after*
Tokyo-Osaka	12 return trips per week	Ditto
Osaka-Fukuoka	6 return trips per week	Ditto
Fukuoka-Seoul	3 return trips per week	6 return trips per week
Seoul-Dairen	3 return trips per week	6 return trips per week

(*b*) The Osaka-Shanghai Route

Osaka-Fukuoka	3 return trips per week	6 return trips per week
Fukuoka-Shanghai	trial flight	3 return trips per week

(4) The Company shall be subsidized by the Government for eleven years from the date of its foundation.

(5) The Company shall take charge of the transportation of mail directed by the Government which shall disburse to the Company an amount of money not exceeding 95 per cent. of the additional postal rate.

The Imperial Society of Aviation, with the approval of the Minister of Communications, announced a new non-stop flight from Tokyo to China. This project links up with that of the continuation of the Tokyo-Dairen line to Shanghai.

As for military aviation, she does not lag in anything behind that of the best-equipped Powers. Japan is already making preparations to link up Fukuoka by airways with the Continent of Asia, Fukuoka-Shanghai being the last Sino-Japanese mail port of the important chain of international air lines which will soon place Tokyo only two weeks from European capitals.

Packing Airplanes for Shipment to China

Assistant Trade Commissioner H. D. Robison, Shanghai

Shipping airplanes to China is comparatively a new endeavor and exporters have not had sufficient experience to obtain the best results. The few airplanes that have been sent to China from the United States and Europe have arrived in fair condition. Importers and aeronautic experts who received and set up the machines have volunteered the following information in the hope that, with improved packing, machines and parts will arrive in first-class condition.

Crates should be constructed of matched lumber, free from large knots, and lined with waterproof paper. In some cases the boxes are handled roughly and should be strong enough to prevent injury to the contents in case of a tip over or to prevent strain if the case is lowered on one corner. This precaution is particularly true of crates containing wings of a wide spread, which come in one section.

Propellers and other spare parts should not be nailed or bolted to the bottom of the crate containing the motor and fuselage, as the oil from the motor causes considerable damage. These parts can be bolted to the top and sides of the case.

All metal parts should be covered with heavy cup grease, such as used by automotive manufacturers. The fuselage, with motor attached, should be covered with heavy paper and securely sealed at all joints with adhesive paper tape. Motors should be covered first with such paper and then the regular fitted canvas paper. Propellers should be wrapped and sealed with waterproof paper.

Manufacturers should always supply a liberal quantity of bolts, screws, cotter pins, safety wire, extra wing, strut bolts, and cowling bolts. Should one wing bolt become damaged during installation it would be necessary to suspend operations for about 10 weeks before a duplicate could be furnished by the factory. There are no sources of supplies for this material in China at the present time.

A very essential thing to attach is a complete set of instructions for assembling. It is only the exceptionally well-trained test pilot who has had training in setting up the modern machines, as in the United States and Europe this work usually is done by mechanics at flying fields. An extra-part catalogue for the ship itself and for the motor is quite necessary. The Chinese mechanics and pilots look for these instructions, first, so that they can make immediate translations, and second, so that they may learn from the manufacturer how to set up and care for the machine.

The top of the case should be marked plainly in several places on each side and end. It also would be advisable for exporters to indicate where the ship's slings should be attached in order to insure proper handling. Shipping firms are anxious to handle this type of cargo according to instructions, in order to prevent expensive claims.

Tne World Power Conference at Tokyo

(Continued from page 451).

not mean, however, universal, uniform, and perfect working organizations but rather general recognition of the principle involved, which is being applied, under different local laws, in such manner as to bring about results generally acceptable by both the public and the public utilities.

This principle must presuppose recognition of the right to grant a monopoly, as competition being wasteful and uneconomical and causing duplication of facilities by necessity therefore, regulation must prevent a monopoly from abusing its exclusive privileges. In the United States this regulatory power has been tested, in almost all cases by state legislatures, in state commissions, or boards variously designated as public service commissions, corporation commissions, with varied power according to the state, and which have to act as arbitrators between the utility which has a service to sell and the public which wishes to use service, deciding cases brought before them on their own merits.

As to federal regulation, the author again quotes from the speech delivered by President Hoover which states that this is advisable "Only when individual states are without power to protect their citizens through their own effort." It may not be amiss to recall that in Japan, by Article 6 of the laws for electric enterprise, the government in charge is empowered, on its own volition, to issue ordinances restricting rates, and/or regulate terms and conditions in connection with the supply of electricity. In order for a utility to operate, in the United States, it is necessary first to obtain from a commission a certificate proving that public convenience and necessity require it. In Japan, it is a license that electrical enterprises must first obtain from the minister in charge, and it is further necessary to have the approval of the administrative office which, in this case means a self-governing body, before they commence construction and before beginning electrical installation, and the laws go so far as to specify a certain period of time within which the construction must be started.

Japan During 1928

By J. Tsushima (Financial Commissioner of the Imperial Japanese Government, Financial Attaché to His Imperial Majesty's Embassies in London, Paris and Washington)

THE year 1928 may be said to have had a marked significance in the life of the Japanese nation, both politically and economically. The world is well acquainted with the occurrence of the enthronement of the new Emperor, which was celebrated in Kyoto under a serene sky in autumn, amid the grandeur and historical traditions of Japan. The national spirit and the loyalty as manifested by the whole nation on the occasion were worthy of this unique empire, which has existed for 2,589 years and ranks with the greatest Powers in the world. The year is also memorable by the fact that the first general election took place in March under the system of universal suffrage which was adopted in 1927, and was responsible for the increase in the number of voters from 3,288,000 to 12,406,000. The election was attended with the gratifying result that more than 80 per cent. of the voters went to the poll, and so a true Parliamentary spirit was displayed by the nation. Apart from this political aspect, the Japanese nation gave proof of its ability to surmount any economic difficulties in the satisfactory solution of the banking crisis which occurred in 1927.

The salient features of the economic position of 1928 are traceable to the abnormally easy condition of the Money market. The banking institutions have solidified their structure, and numerous amalgamations between banks have taken place. Owing to the pending question of the removal of the gold export embargo, the foreign exchanges have fluctuated to a considerable extent. During the first half of the year Japan's foreign trade showed a favorable indication of expansion, but this promise was not maintained to the extent auticipated in the latter half of the year.

New Banking Law

The most important event of banking interest was the putting into force on the newly-enacted " Banking Law" from the beginning of the year. This law may be regarded as marking a new epoch in the history of Japanese banking. Full advantage was taken of the bitter experiences of the crisis of 1927 in order to place the important financial institutions on a sounder basis. Despite the short period during which the new law has been in operation, it already accomplished the purpose for which it was introduced, and the Government has been able to exercise a strict supervision of the whole banking organization. It has also led to a closer internal supervision by the banks themselves and their adoption of the principles laid down.

It should also be noted that a further readjustment of the banks which closed their doors during the crisis was made, as a result of which the resumption of business by those carrying 90 per cent. of the deposits affected by the crisis was announced. In a large measure, the resumption was due to the appropriate step taken by the Bank of Japan in making special advances for the purpose, under powers conferred on it by two Laws passed in 1927. The advances made in this way amounted to Y.879,000,000 up to the time fixed for the accommodation (May 5, 1928,) advances to banking institutions in Formosa accounting for Y.191,000,000. Compensation was made to the Bank of Japan in respect of the latter advances by the Government in June last, leaving the balance of special advances at Y.687,000,000 (of which Y.44,000,000 was collected). It is worthy of mention that, despite the large amounts of advances still outstanding, no conspicuous increase took place in the bank note issue, owing largely to the various precautionary steps adopted by both the Government and the Bank of Japan.

It is important to observe that the funds advanced by way of special advances explain the Money market easiness noticed during the last year, and at this period a large amount of deposits formerly held by small local banks was shifted to big banks, trust companies and the Post Office savings banks. The figures of these institutions amply demonstrate the significant concentration of funds which took place after the banking crisis :—

(In million yen.)

——	Feb. 1927 before the crisis)	At the end of 1928	Increase
Five big banks (Mitsui, Mitsubishi. Sumitomo, Dai-Ichi, Yasuda (deposits at six big cities)	1,668.8	*2,395.1	728.3
Trust companies (money in trust)..	472.1	1,008.8	536.7
Post Office Savings Banks (savings deposits)	1,163.5	1,742.7	579.2

A difficult problem confronted the big banks. Industrial enterprises were more or less stagnant since the crisis and accordingly did not afford suitable means for the investment of the surplus deposits, while the banks adopted a very cautious policy of investment. With a view to mitigating the excessive easiness of the Money market and absorbing the surplus funds of the banks, the Government issued loans amounting to no less than Y.599 million during the first six months of 1928, the purpose of which was partly to effect conversions at a lower rate of interest, and partly to form new issues as already contemplated in the Budget. In addition to this step the Bank of Japan sold out to the market its holding of Government bonds, amounting to Y.430 million. The municipalities and big industrial firms took advantage of the exceptionally easy market conditions to float conversion bonds or debentures which in the aggregate totalled the considerable sum of over Y.2,000 million.

Some portion of the idle money was remitted abroad for investment and this outflow may have adversely affected the yen exchange to some extent.

Banking Amalgamations

The tendency of Japanese banks to amalgamate, in consequence of Government recommendations, became more pronounced during the year. Facilities were afforded by the Bank of Japan and the banks themselves were desirous of consolidating. The number of banks decreased by the amalgamations was 197 in 1928, as compared with 103 in 1926 and 120 in 1927. In.1928 there were 1,123 banks (ordinary banks), whereas in 1926 the number was 1,420.

The following table will show the trend of the banking amalgamations since 1915 :—

Year	Number of banks affected by amalgamation	Number of banks decreased in consequence of amalgamation
1915-1923	699	368
(yearly average)	77	41
1924	96	47
1925	154	85
1926	194	103
1927	216	120
1928	349	197
Aggregate total	1,708	920

Foreign Trade

The foreign trade prospects at the beginning of the year were fairly bright as compared with those of preceding years, and the excess of imports over exports in the first half of the year reached only Y.236,000,000, which is the smallest figure since 1912, although this tendency was somewhat checked owing to the increased imports in the latter half of the year. Figures of the imports and exports during the last three years are appended :—

(In million yen.)

	Exports.	Imports.	Excess of Imports.
1926	2,044	2,377	322
1927	1,992	2,179	186
1928*	1,971	2,192	221

* The figure for December is provisional.

The decrease in the exports noticed above is mainly attributable to the falling off of the silk shipped to the United States, as well as that of exportation of cotton goods. Shipments to the countries bordering the South Seas also showed some reduction. Trade with China showed peculiar tendencies ; the great disturbances in China would lead to the assumption that Japanese trade with that country would have been much adversely affected. The figures show that Japan's exports to China increased in 1928 to more than those of the previous year. The actual trading figures for the two years are :—

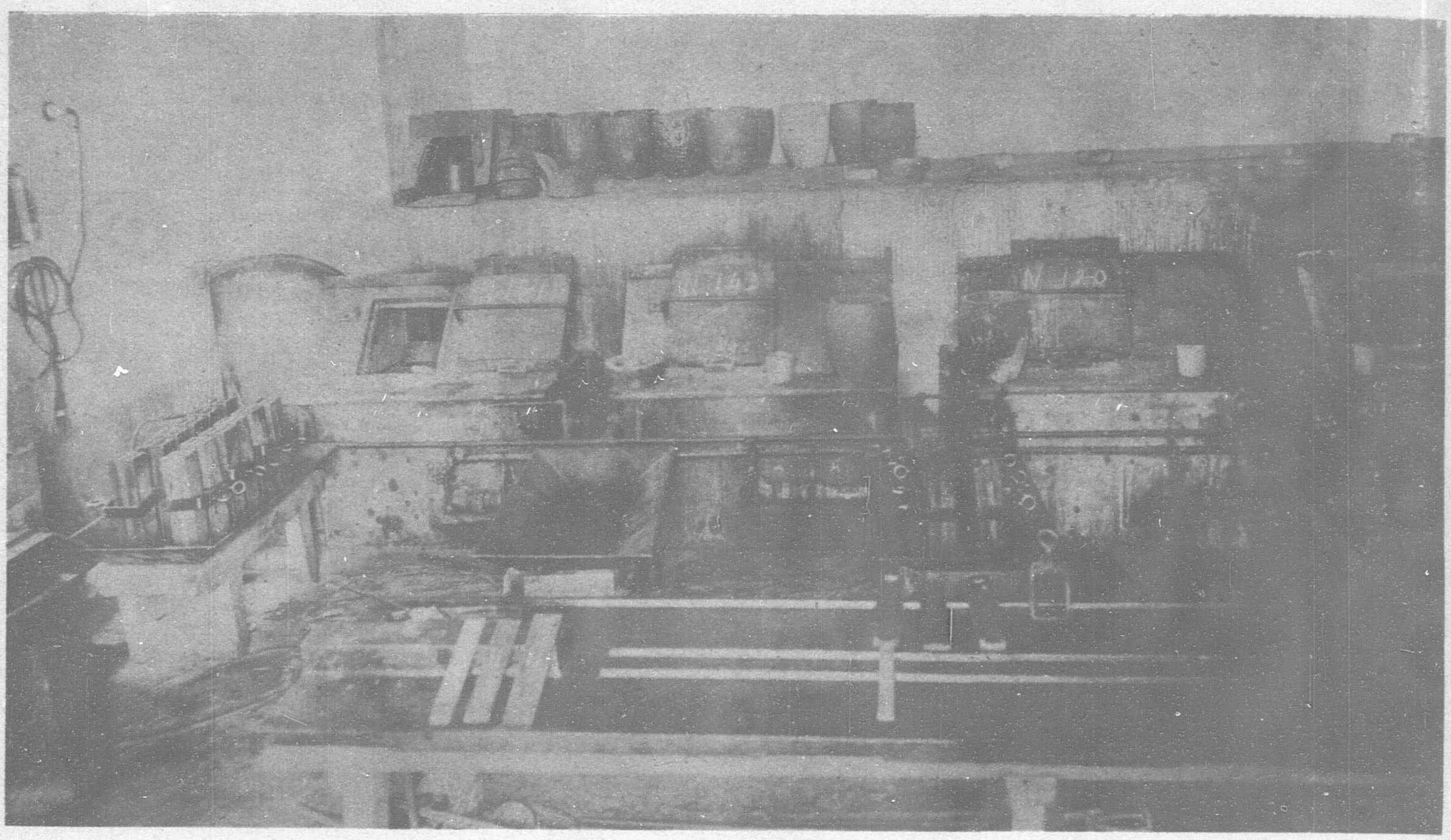
	Million yen.
1927....Japan's exports to China	334
1928.... „ „ „	365
1927....Japan's imports from China	226
1928.... „ „ „ „	229

Gold Embargo

Many fluctuations in the yen exchange during the year is noticeable, as is evidenced by the fact that the quotation of the Yokohama Specie Bank was changed nearly 100 times, an unprecedented event in recent years. These fluctuations took place within the limits of $46\frac{1}{2}$ and $47\frac{1}{2}$ during the first six months of the year, but their range was a little wider during the latter part of the year, as was to be expected, since the export trade was not so good. Great interest has been aroused as to the necessity of stabilizing the foreign exchange, and the question of the removal of the gold export embargo has become eminent.

Now that the reconstruction work necessitated by the earthquake has nearly been accomplished and the reorganization of banking conditions has almost been carried out, the only question waiting for solution by the Japanese nation is the removal of the gold embargo. The Government is doing its best for this purpose and is supported by the wholehearted co-operation of the people. Furthermore, as it was quite recently reported that a satisfactory solution of the Chinese problems was going on, no doubt exists that the problem will be solved as soon as the circumstances will allow.

* At the end of October.



Gas Fired Melting Furnaces

The first operation in a Mint is the melting of the metal, which is practical either by the electric furnace process, coal, fuel oil or gas. These furnaces are of the stationary type crucible gas furnace with No. 80 graphite crucibles fitted with special high refractory furnace .linings with burner and mixing valves for producer gas at 140 B. T. U. and air at 1½ pounds pressure.

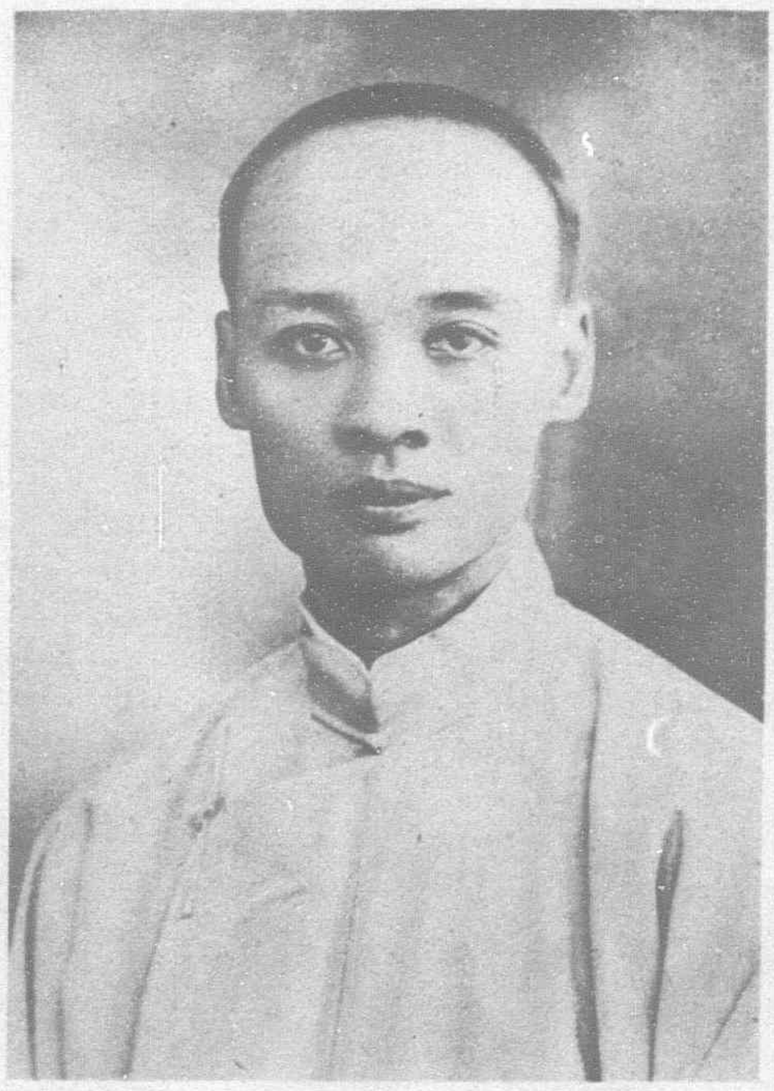
The ingot mould will be mounted on a special revolving turn table all movable on a track in front of the melting furnace. This ingot will be 20-in. long.

The Shanghai Mint

THE reorganization of the Shanghai Mint is making definite progress under the direction of Mr. Kwok Bew, Mr. Lott H. T. Wei and Mr. Clifford Hewitt. Mr. Kwok Bew has achieved a very great reputation as a merchant and industrialist being the head of the Wing On Department Stores, cotton mills and other industries; Mr. Wei is an engineer and a graduate of the school of commerce and finance, University of Pennsylvania and also former manager of Nanyang Bros. Tob. Co. and Chinese manager of the Lower Property of Butterfield & Swire, Hankow, Mr. Hewitt designed the mint and is now its technical adviser.

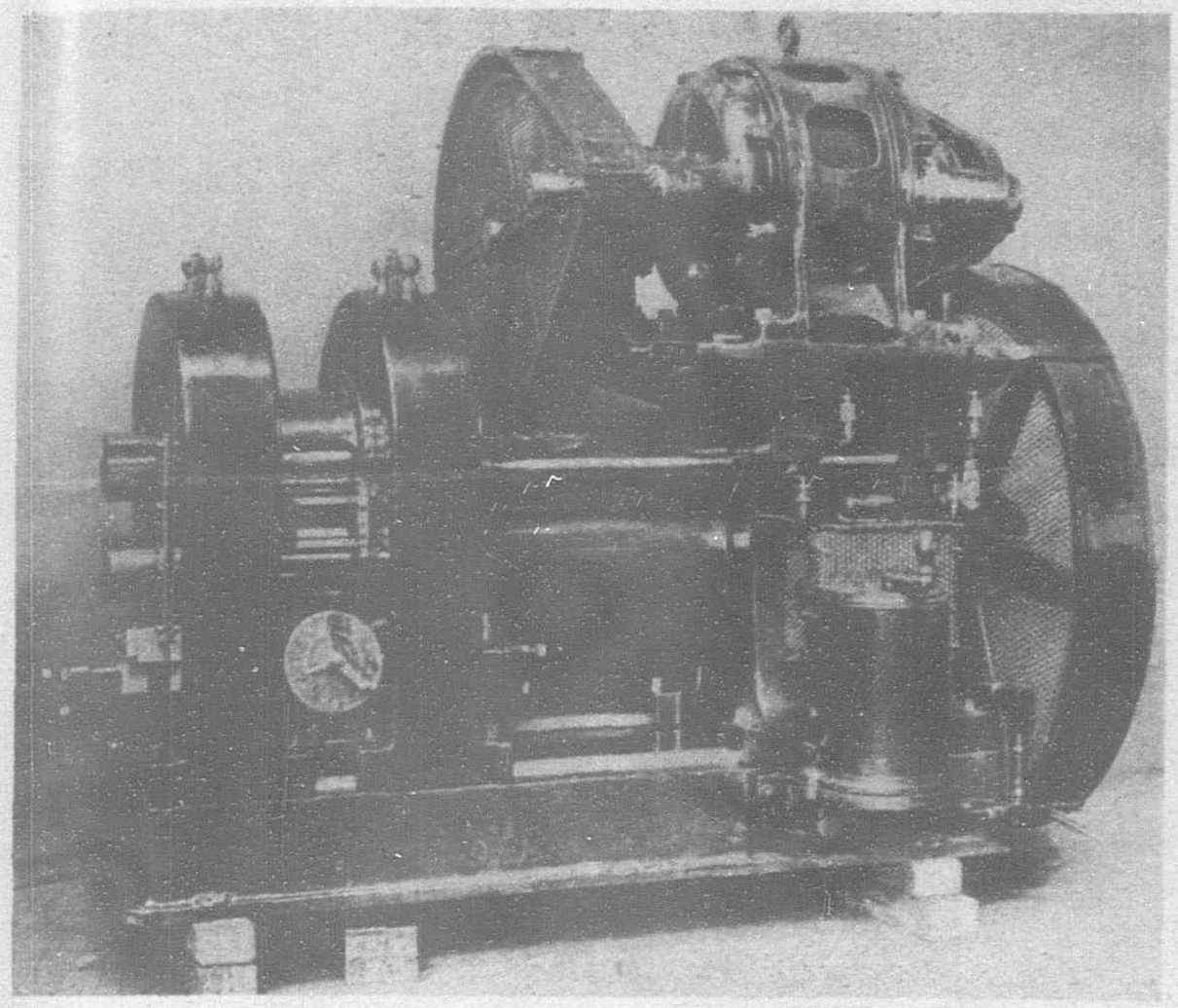
The story of the Shanghai Mint is a long one. For many years the Hangchow and Nanking Mints operated as semi-private businesses. It seemed that a practice developed of limiting the production of these mints so that the cost of dollars became very high and speculators made fortunes while business men and the people suffered. In August, 1918, the British Chamber of Commerce of Shanghai resolved that the Chinese Government be asked to standardize national currency, so as to do away with the tael system. Behind this formal resolution was the promise of the British banks and hongs that if a modern mint were established, under foreign supervision, they would cooperate in abolishing the tael. The Shanghai Bankers' Association, in the same year, proposed the establishment of a national mint.

Mr. Kwok Bew, Director

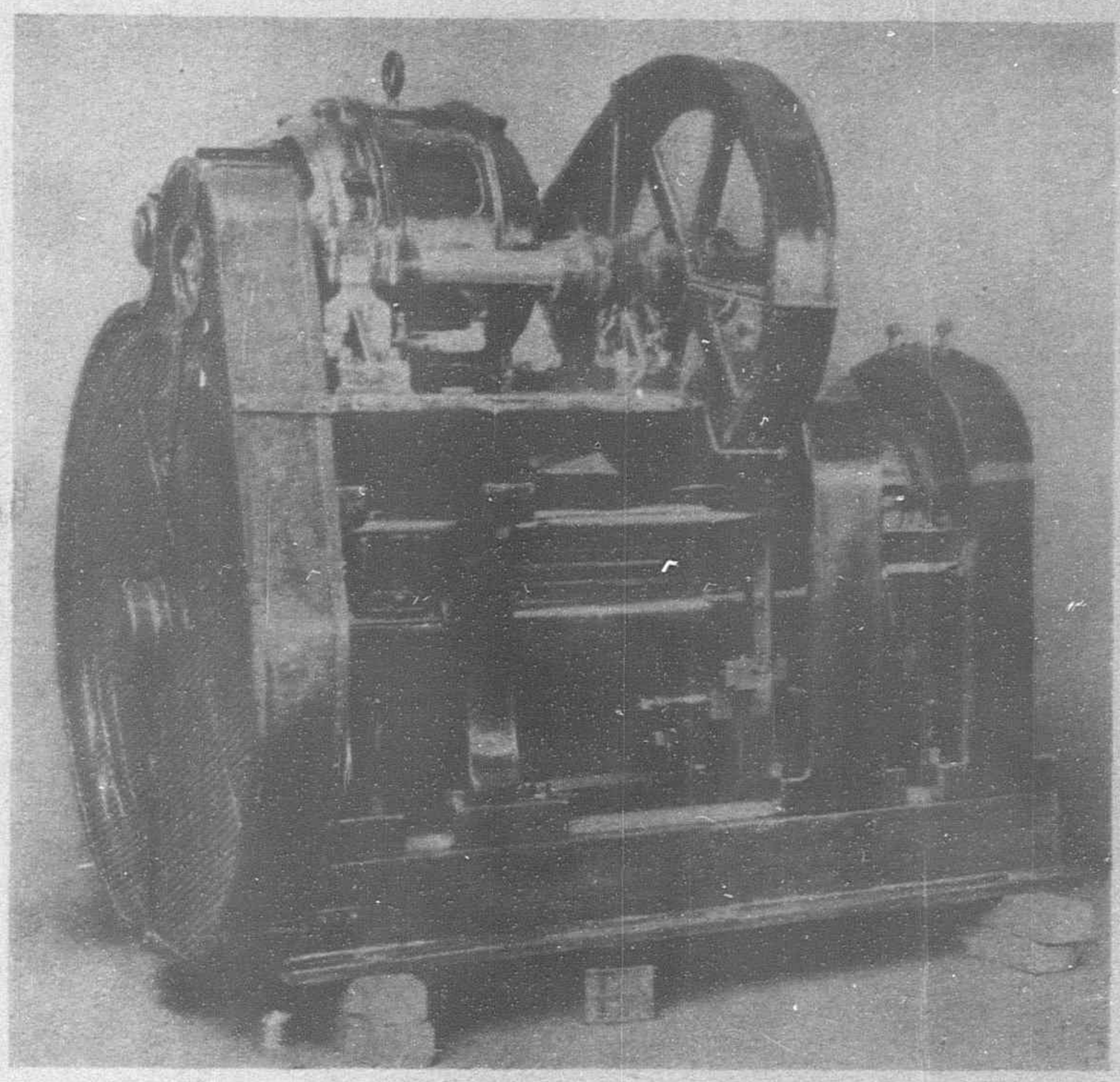


Mr. Lott H. T. Wei, Vice-Director

No action was taken until February, 1920, when the Ministry of Finance appointed Mr. Chung Men-yu to draw up plans for the new mint, which was to be under the control of the Currency Bureau. A Chinese Bankers' group was organized consisting of Shanghai Chinese bankers, who made a loan to the mint, of $2,500,000,

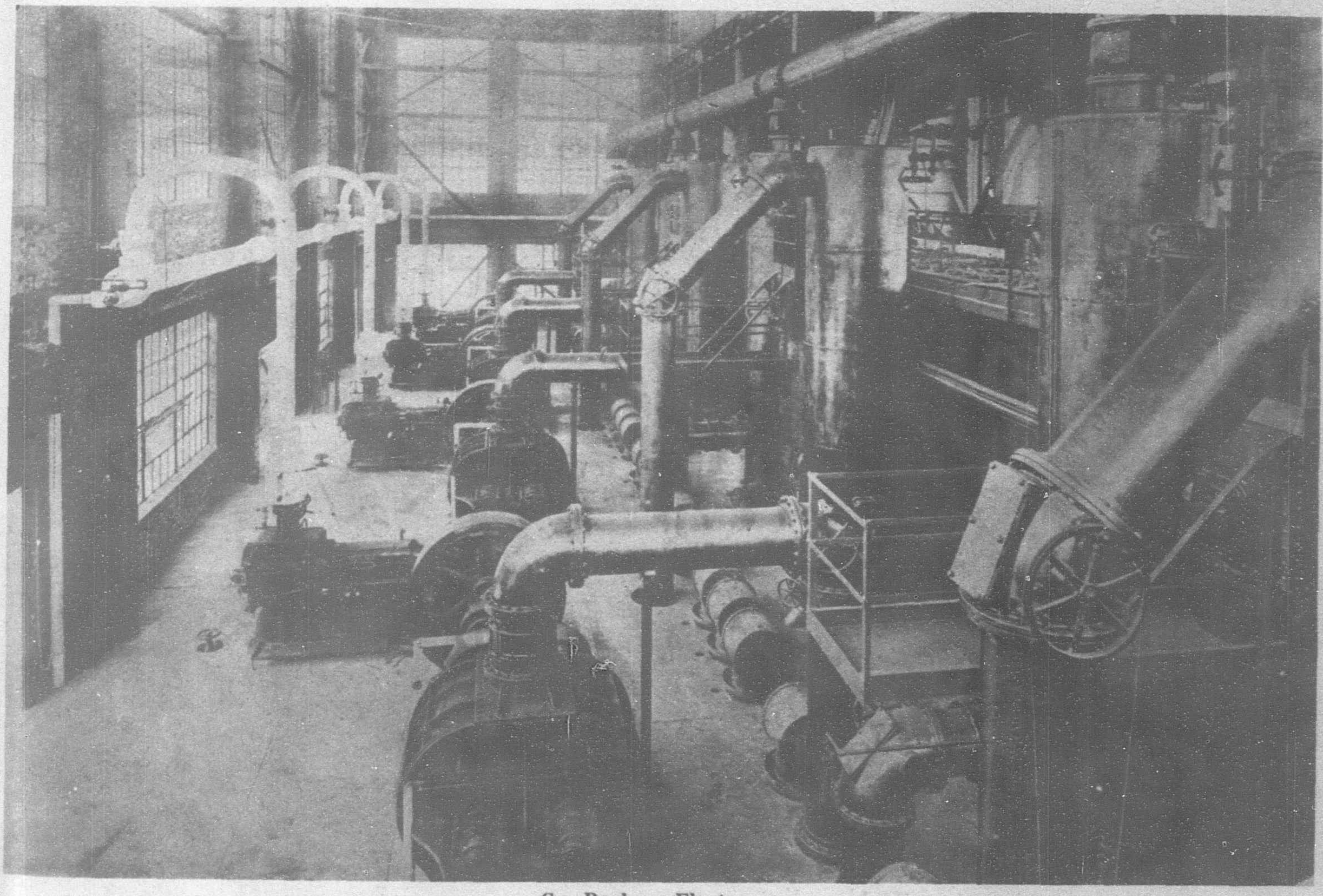


Front View of 50 H. P. Motor Driven Rolling Mill



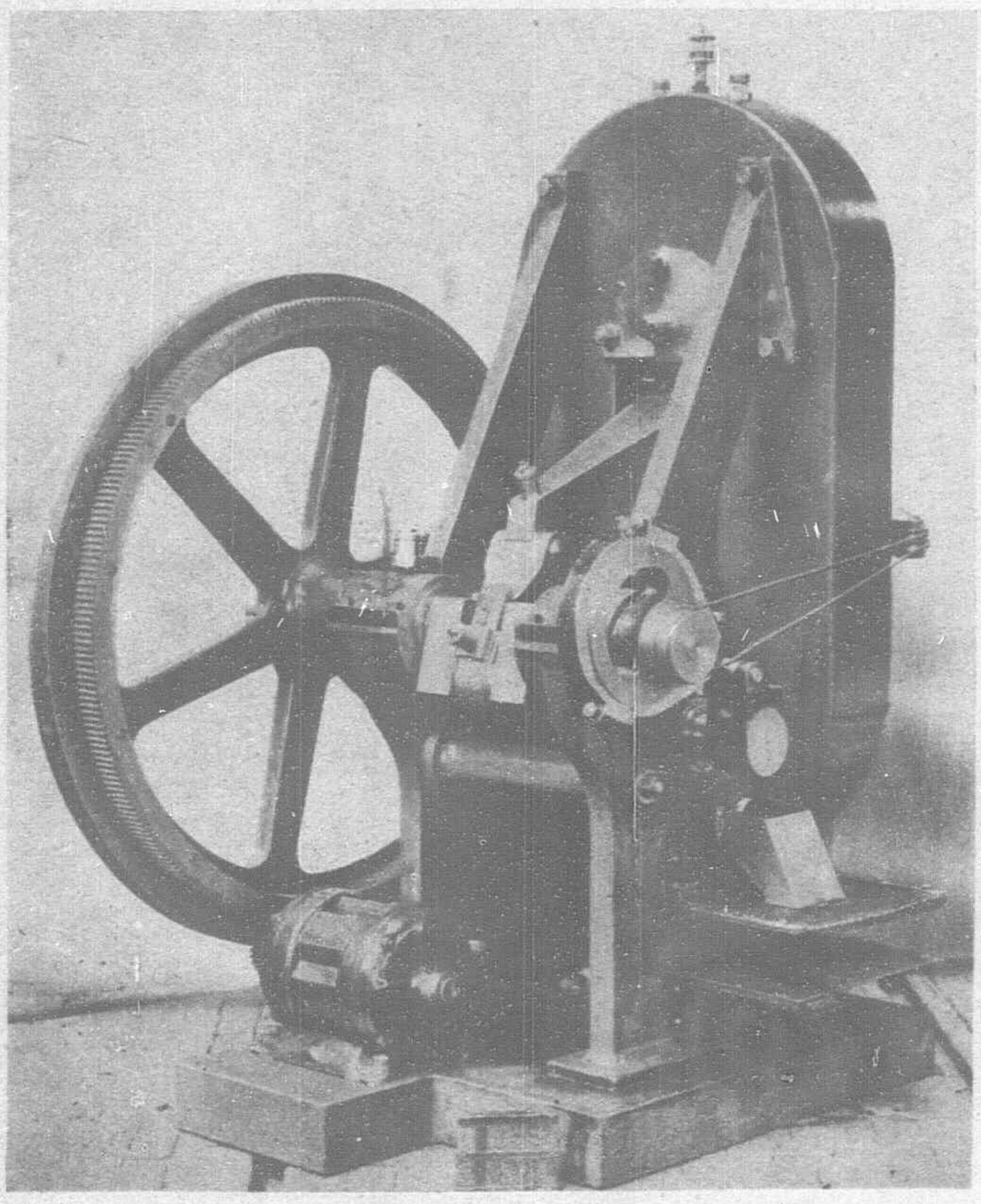
Rear View of 50 H. P. Motor Driven Rolling Mill

Here the ingots are reduced to the proper thickness of the planchet. The two 14-in. × 14-in. breakdown rolling mills are fitted with cast iron chilled rolls driven by a 75 H.P., 3 phase, 60 cycle, 440 volt slip ring motor with type " FA " automatic starter and reversing switch. There are eight finishing rolling mills each driven by a 50 H.P. back geared motor with type " FA " automatic starter and reversing switch. All back gearing and motor shafts are fitted with noiseless raw hide gearing. Each mill is equipped with crucible steel rolls hardened and ground. The roll adjustment of these rolling mills is of a special design through a double taper wedge and a micrometer indicating dial whereby the rolls can be adjusted to one ten thousandths of an inch.

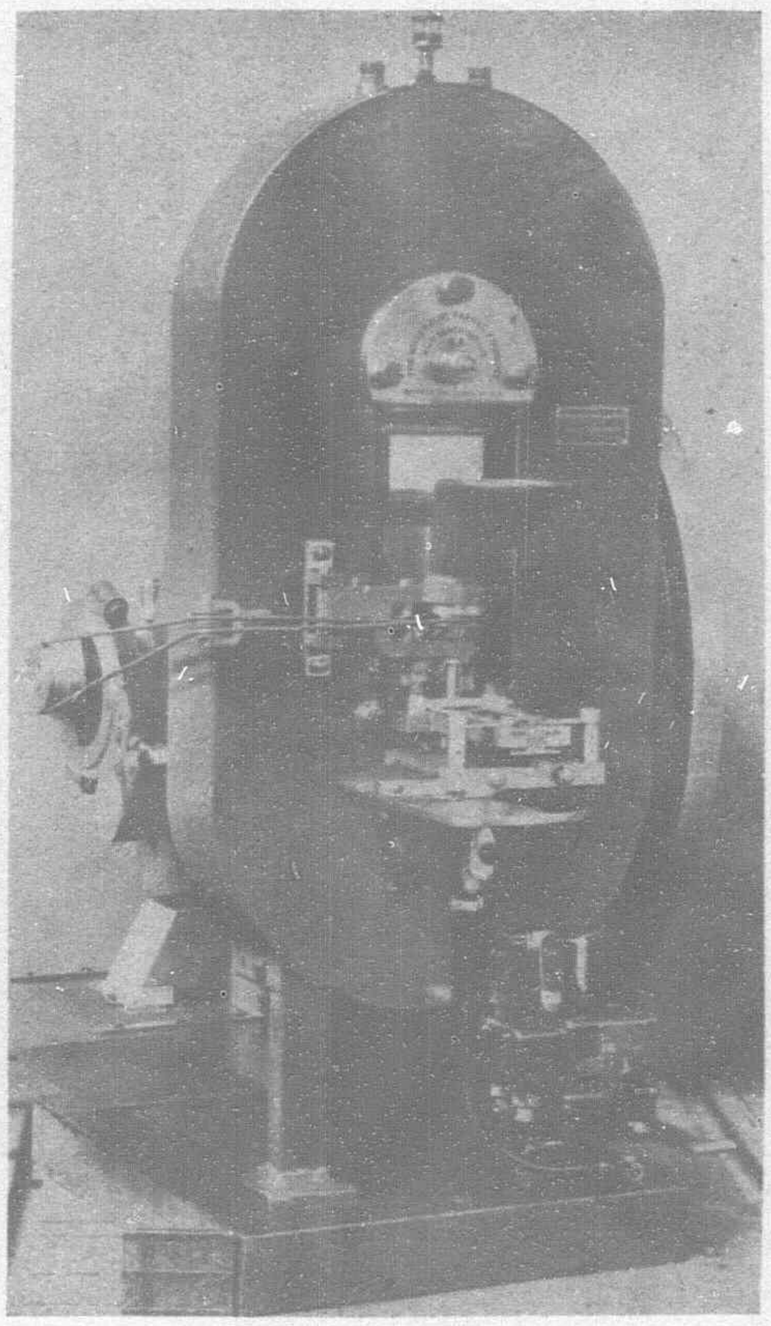


Gas Producer Flant

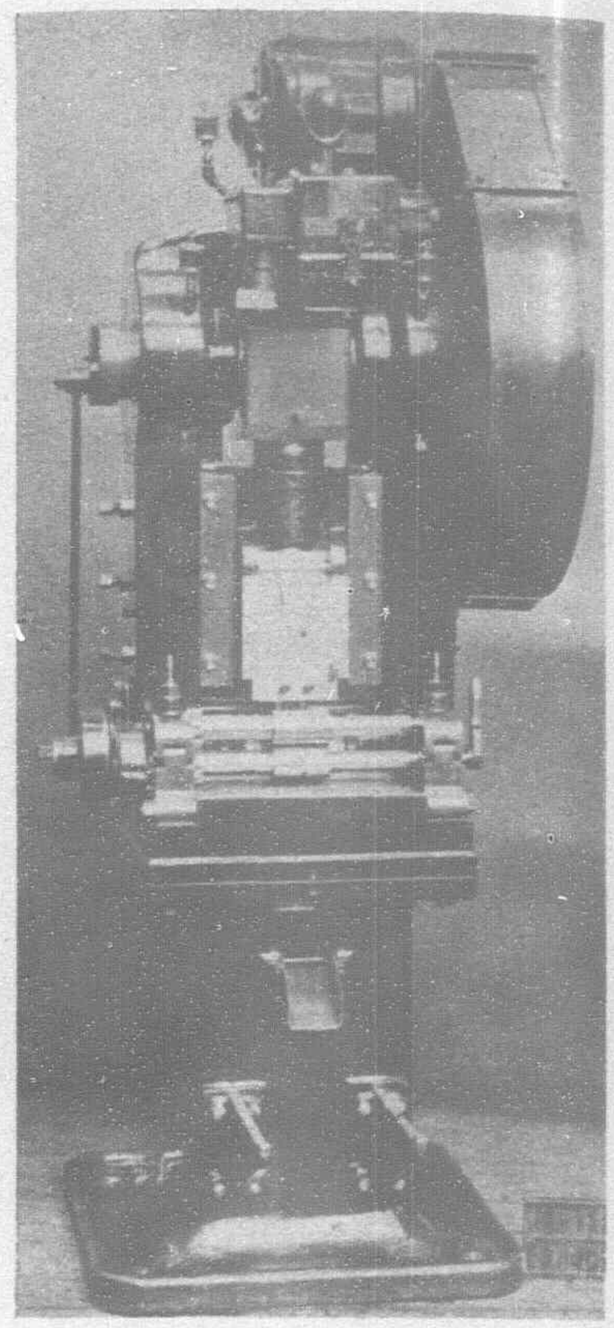
Here are three rotary gas fired automatic motor driven annealing furnaces. The coin blanks are dumped in a hopper in one end of the furnace and fed automatically through a worm retort at a temperature of 1,200 degrees Fahrenheit, and then submerged in a weak solution of sulphuric acid, then dried in a centrifugal drying machine.



Rear View of Coining Press for Subsidiary Coins



Coining Press for Subsidiary Coin



Coin Blank Punching Press

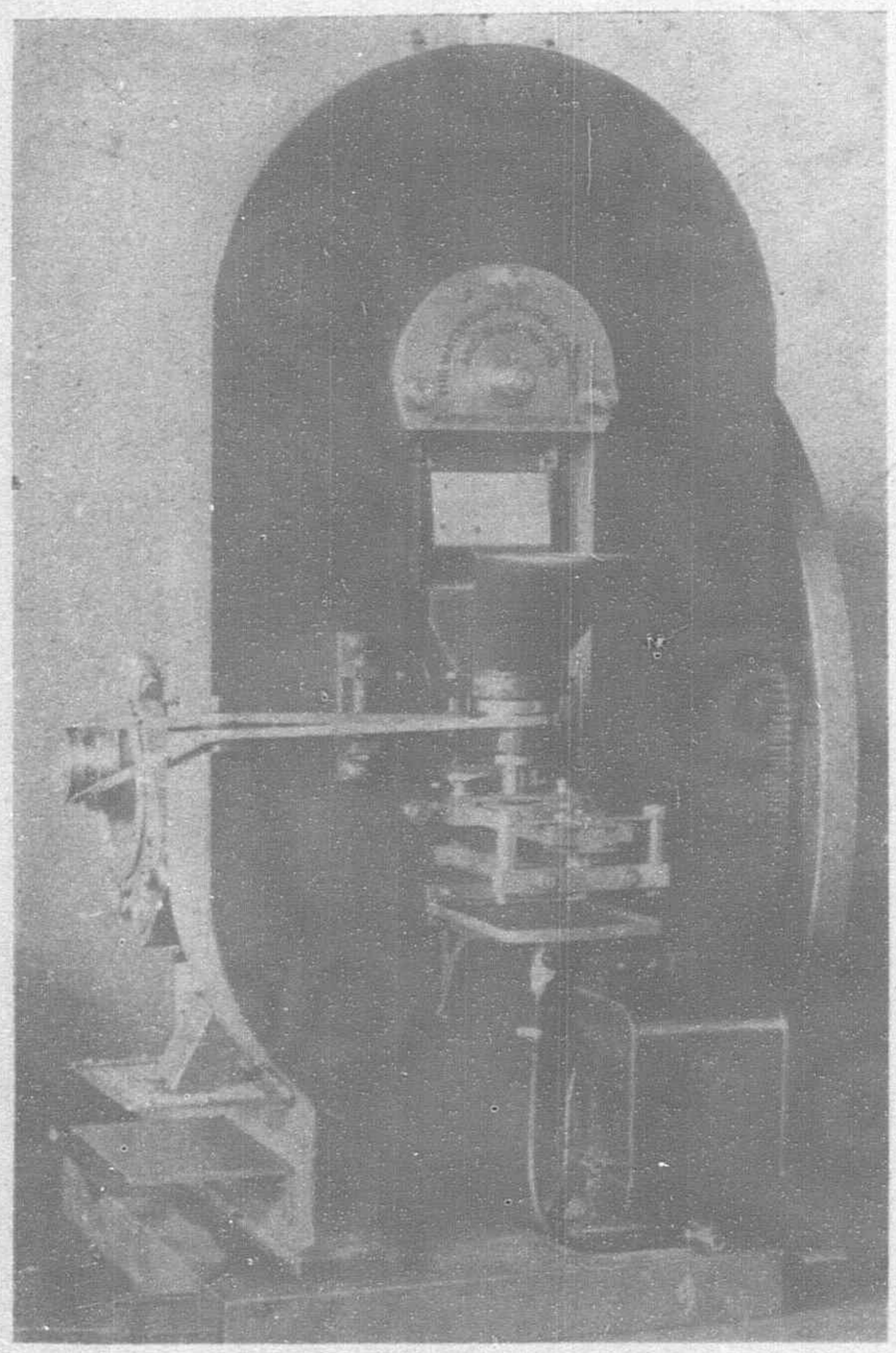
These six punching presses are of a special design equipped with three H.P. motors mounted on top of the presses with raw hide gearing transmission. Each press is fitted with an automatic shear which cuts the punched strips into short pieces.

which was signed on March 2, 1921. The bonds were issued at 93, bearing interest at 9 per cent. and were to have been redeemed by monthly instalments appropriated from the Salt Surplus.

One of the most interesting paragraphs in the contract was the following:

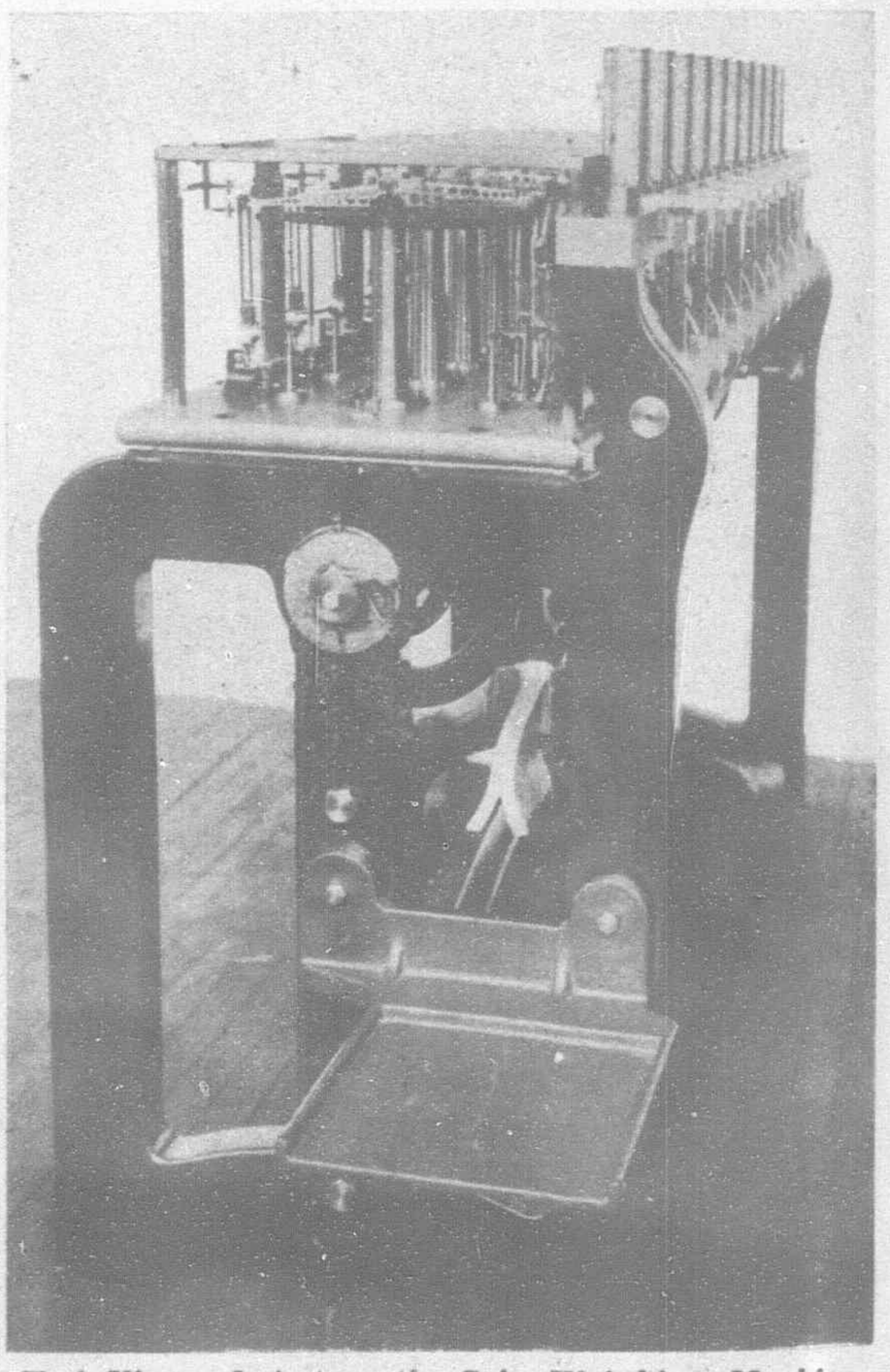
"The money derived from these notes is to be exclusively used for the purchase of land, the building of the mint and its equipment with machinery. Within one month of the signing of the contract the parties of the first part will instruct the officers of the Shanghai mint, and their engineers and contractors, to draw up a detailed plan for the approval of the parties of the second part. Upon the latter's approval, the building of the mint will proceed without delay, and an immediate order for the required machinery will be placed."

A change very soon took place. Mr. Sah Fumou was appointed Director of the mint, a plot of land was purchased near Soochow Creek and Mr. Clifford Hewitt, who had been employed by the American Government as a mint expert, was employed as an adviser. He designed the new mint and the contract for the machinery was given to the American Trading Company, which represented American mint machinery companies.



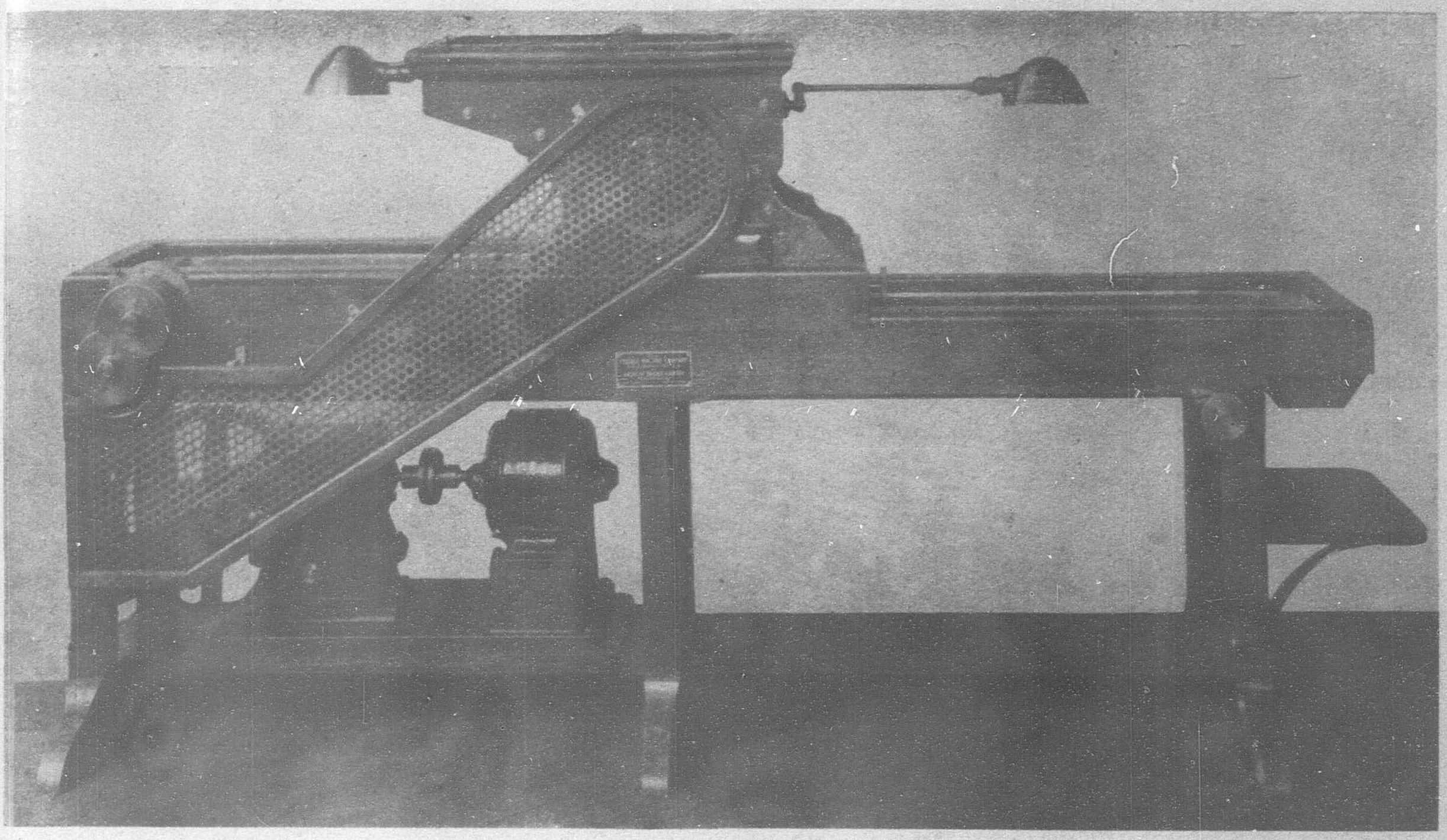
Coining Press for Dollars

The stamping of the coin is done by sixteen coining presses. Each press is driven by its individual motor and equipped with a type A automatic starter and automatic coin blank feeder.



End View of Automatic Coin Weighing Machine

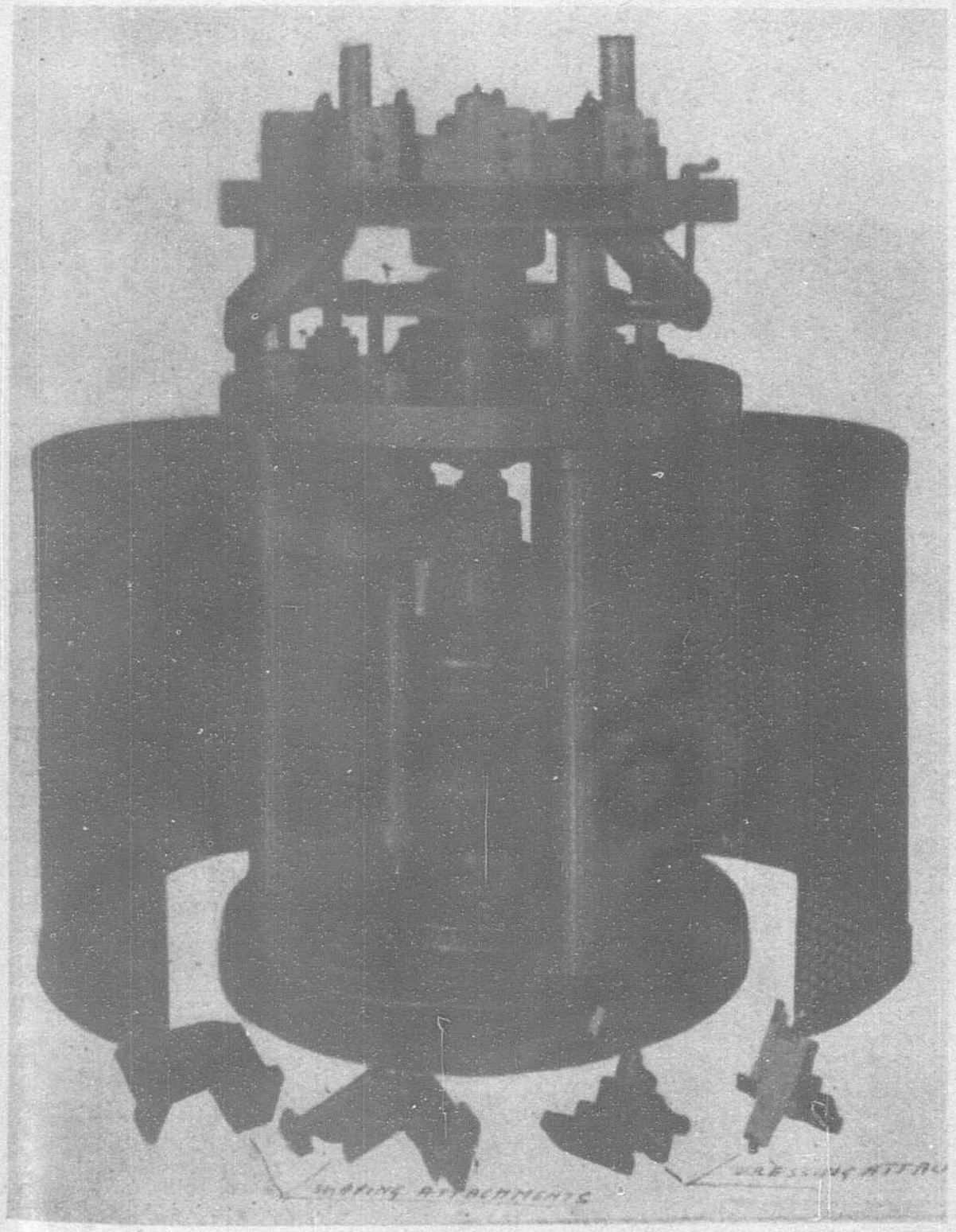
By the end of 1923, the buildings were nearing completion but there was a shortage of funds due to miscalculation, adverse rates of exchange, etc. An additional $3,000,000 was necessary and as there were no further funds forthcoming, the work was suspended on



Coin Reviewing Machine

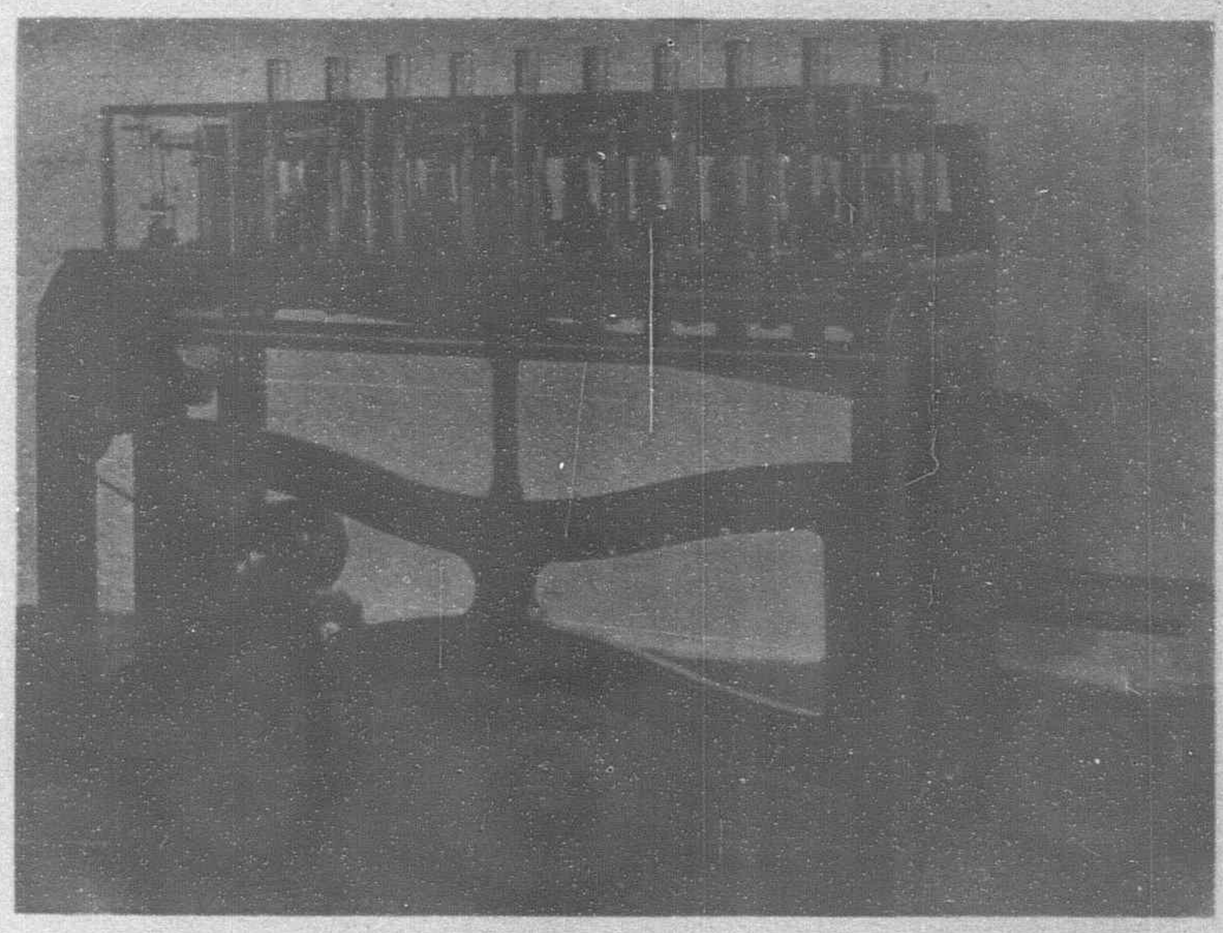
August 18, 1924. The machinery, when it arrived, was removed to godowns. A special committee of the Shanghai Bankers' Association was appointed custodian of the property on Soochow Creek.

The Economic Conference convened by Mr. T. V. Soong, Minister of Finance, in June, 1928, passed resolutions for the early abolition of the tael and the re-opening of the Shanghai Mint. It was then that Mr. Soong appealed to Mr. Kwok Bew to undertake this work and Mr. Hewitt was requested to return to China to supervise it. Arrangements were made with the American Trading Company, so that the machinery was released and installed under Mr. Hewitt's supervision. Mr. Soong found the funds to start work and the mint is now well under way to completion.



Coin Blank Upsetting Machine

This is done by six 3 H. P. vertical driven motor upsetting machines. These machines are fitted with special coin blank reducing devices, also geared groove dressing devices.



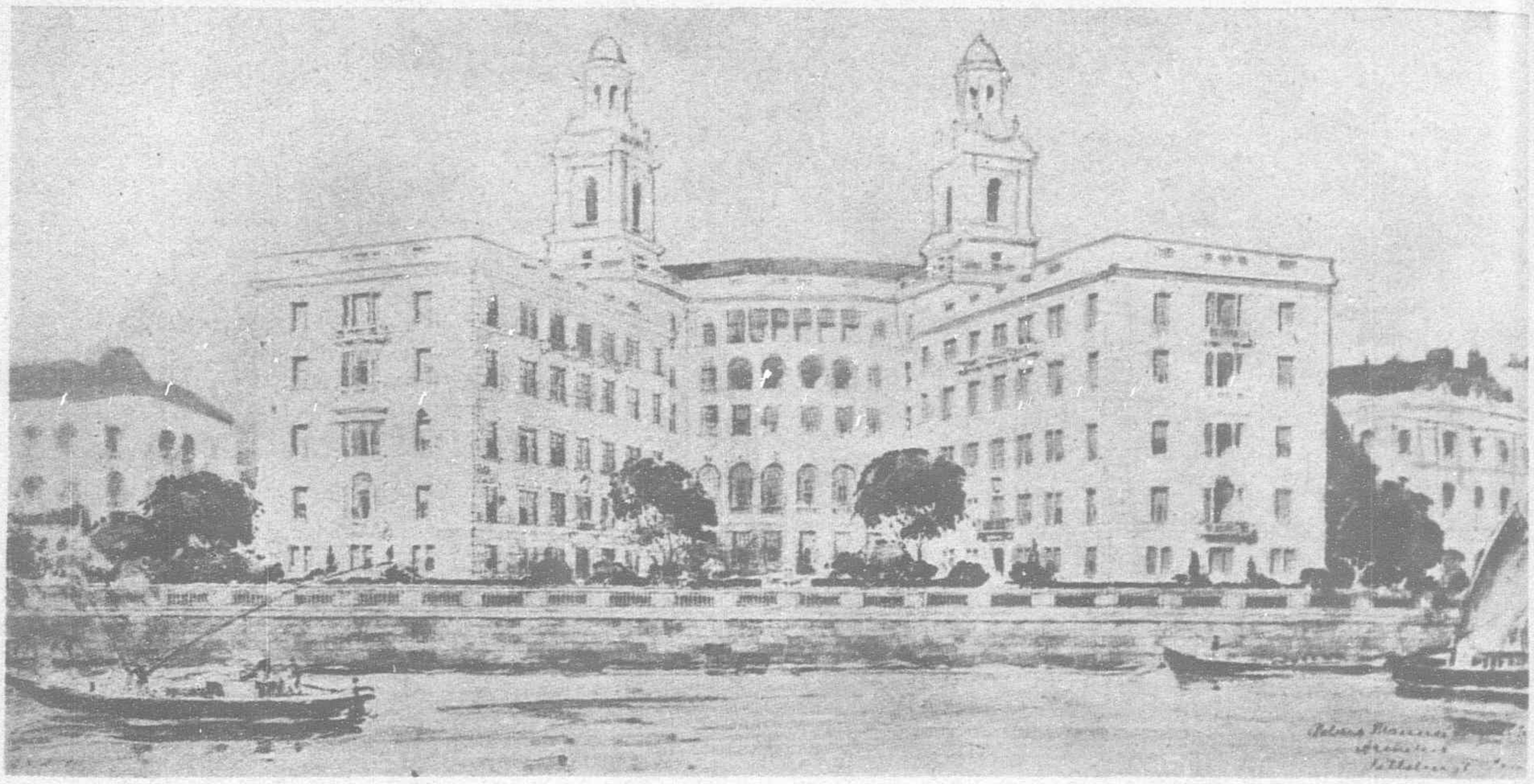
Front View of Automatic Coin Weighing Machine

The coins are dumped in a hopper and automatically distributed on a travelling endless belt, where the imperfect coins are taken out.

There are twelve special designed automatic coin weighing machines. Each machine consists of ten units or ten weighing beams weighing one hundred coins per minute. Each machine has its own individual motor drive. One of the special features of this machine is the prevention of recoil when the beam swings either up or down. Mounted on the end of the frame is a small electro-magnet which becomes energized whenever the end of the beam touches either of the contact points. The armature of the magnet is then energized and grips the weighing pan preventing any false movement of the beam in recoiling.

United States Government Buildings in Asia

THE report of the Foreign Service Buildings Commission recently published, reveals that out of a total of $10,000,000 appropriated by Congress under the Foreign Service Building Act of 1926, for the acquisition of buildings and grounds in foreign countries for United States Government purposes, approximately $6,000,000 have already been allocated and, of this amount, $3,068,904 represents the estimated cost for nine buildings in Asiatic countries. A résumé of allocations and expenditures from the building fund shows the amounts set aside for these nine buildings;



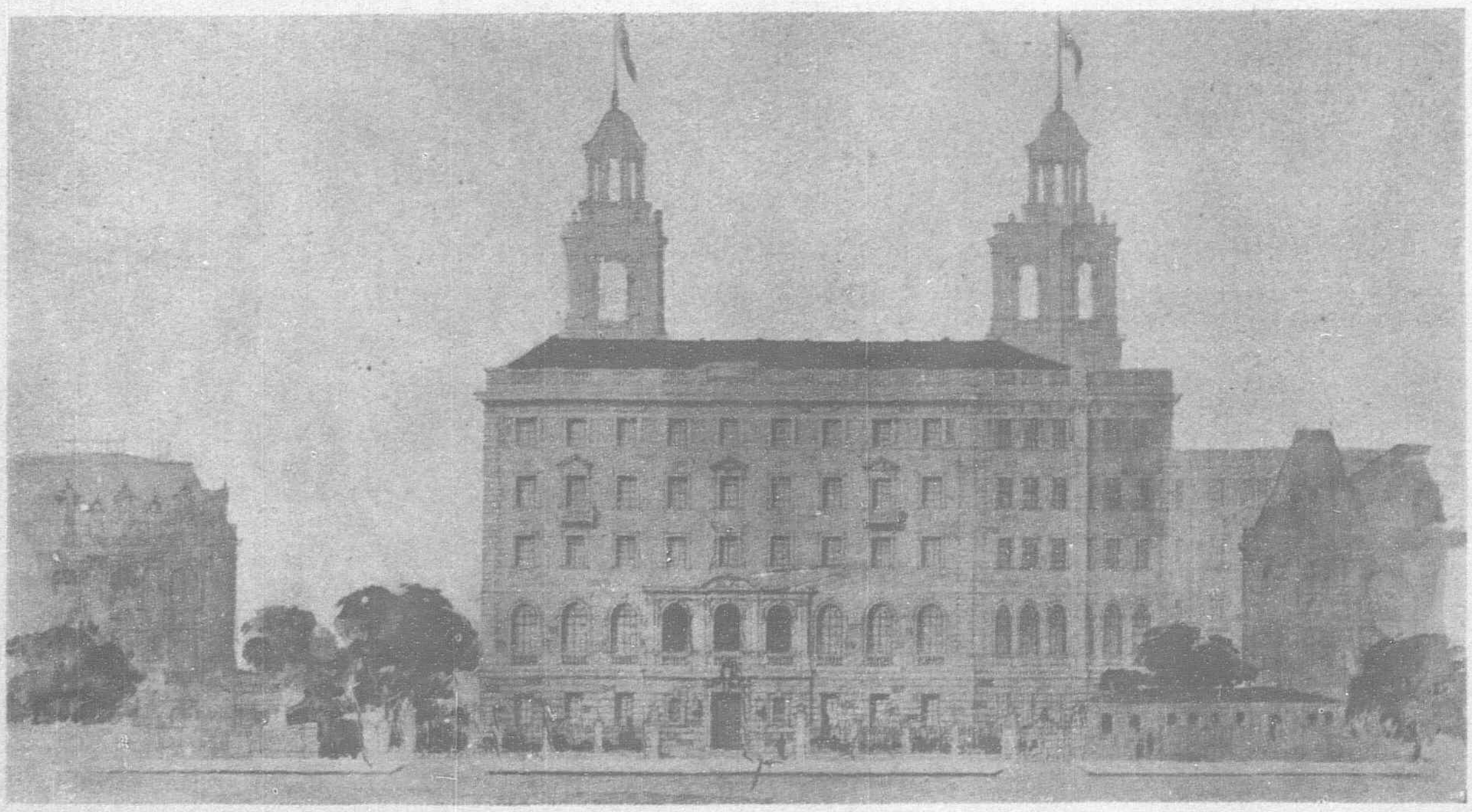
(Robert Maurice Trimble, Architect)

Waterfront View of Proposed American Government Building, Shanghai, China

Post		*Allocation*	*Expenditures and Obligations*
Teheran	(Legation)	$90,000	$58,348.46
Yokohama	(Consulate)	150,000	
Penang	,,	35,000	26,206.53
Bangkok	(Legation)	117,000	12,200.63
Calcutta	(Consulate)	500,000	153,769.95
Shanghai	,,	650,000	24,200.00
Mukden	,,	75,000	
Nagasaki	,,	21,000	20,936.42
Aden	,,	18,000	16,356.30
Amoy	,,	62,904	56,414.82
Tokyo	(Embassy)	1,250,000	242,461.18
		$3,068,904	$610,890.00

The Commission in charge of carrying out the provisions of the Act is headed by Representative Stephen G. Porter of Pennsylvania and is composed of the Secretaries of State, Treasury and Commerce, and the chairman and ranking minority members of the committees on foreign relations of the House of Representatives and the Senate, with Consul General Keith Merrill of the Foreign Service, as Executive Secretary.

Up to 1926, our embassies, legations and consulates were housed in rented structures. In this year, Congress appropriated $10,000,000 for the purchase of existing buildings or the erection of new ones and the recent report describes the progress in construction, acquisition of sites and buildings, together with remodeling, repairs and furnishing. Owing to the fact that public disclosure of the allocated amounts and the proposed locations would prejudice negotiations for their purchase to the disadvantage of the government, the report describes only those transactions which have been successfully terminated in the transfer of title to the Government. In addition to the published list covering the allocations noted above and for buildings and sites at London, Tirana, Managua, Prague, Paris, Tegucigalpa, Corinto, Panama City, Bluefields, Ottawa, Matanzas, Santiago de Cuba, Rio de Janeiro and Lima, negotiations are pending for the purchase of additional sites for embassies, legations and consulates in several of the capitals and other important cities of the world, particularly in unhealthful posts, where Government ownership of modern American-designed structures will go far to protect the health of American officials.



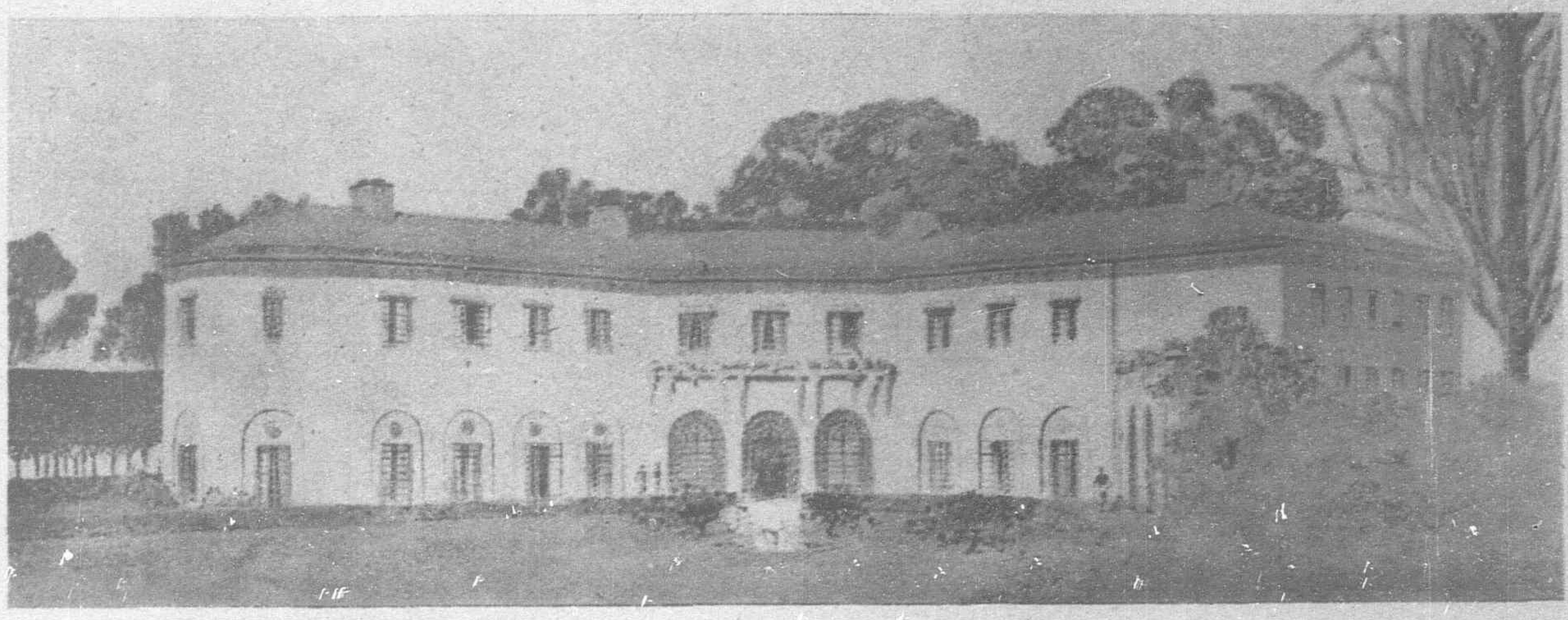
Front Facade on Whangpoo Road of Proposed American Government Building at Shanghai, China

The interesting thing about the designs of the buildings is the attempt to reproduce on

foreign soil replicas of famous American buildings, carrying out examples of typical American architecture. Most of the designs are of the American colonial type, although in some instances where suitable buildings of the country are available, existing quarters will be acquired and remodelled.

Amoy, China

The Amoy Consulate, designed by Mr. Elliott Hazzard, an American architect practicing in Shanghai, follows the general line of our southern colonial architecture, suitable for the warm climate of this southern Chinese port, which is comparable to that of Atlanta, Georgia. On February 2, 1921, $62,904 was appropriated and reappropriated from year to year for the demolition of the present American consular buildings at Amoy and the construction of a new building on the same site.



Proposed Residence for American Ambassador, Tokyo, Japan

View from Proposed Residence for American Ambassador of the Proposed American Office Building and Apartment Buildings at Tokyo, Japan

At its first meeting the Foreign Service Buildings Commission approved this work, and accepted the design of Mr. Elliot Hazzard and authorized the Consul General at Shanghai to call for bids from construction companies. Contracts with the successful bidders have been concluded and construction is almost finished. Voh Kee of Shanghai are the contractors.

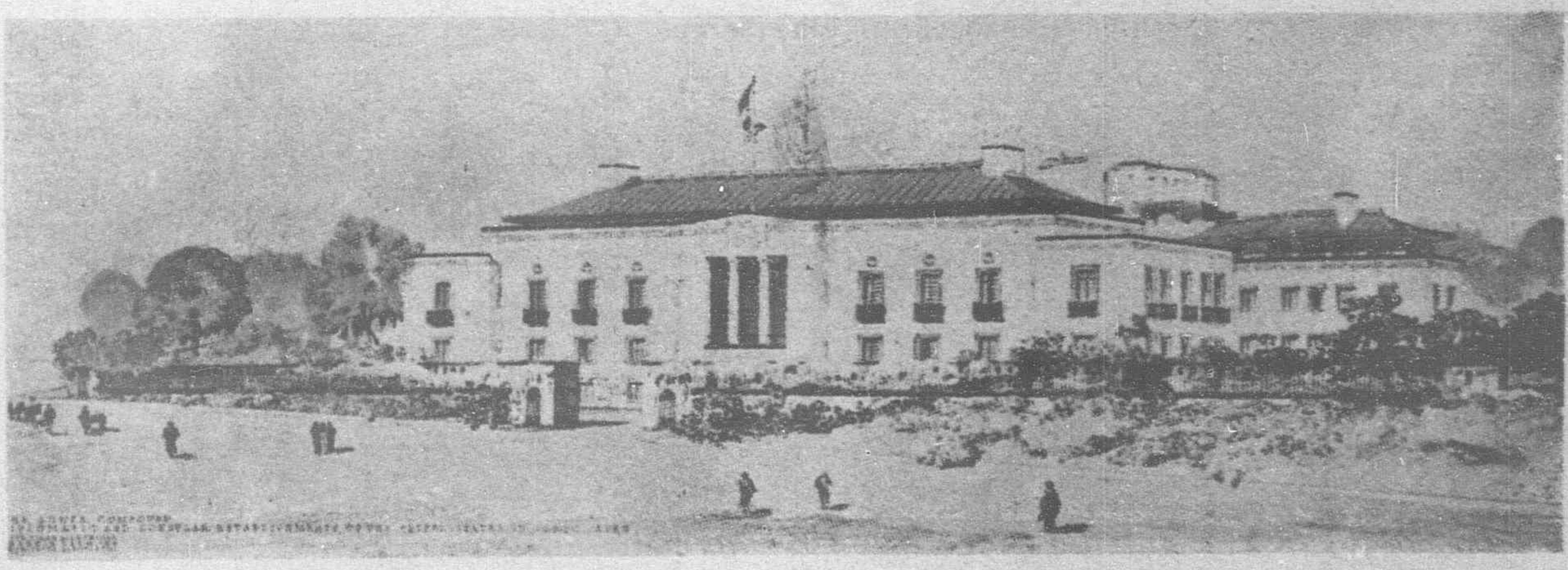
Tokyo Embassy

The plans for the pending project for an embassy and office building at Tokyo, authorized by an act of February 21, 1925, were not at first approved as no provision was included for residential quarters for the American attachés, military, naval and commercial, nor for the American members of their staffs. Mr. H. Van Buren Magonigle, the architect for this buildings, was instructed to prepare alternate plans, with probable costs, which would include these provisions. Complete plans have now been approved and working drawings and specifications are about completed. This group of buildings to be erected on the old embassy grounds, calls for the expenditure of $1,250,000.

The pre-earthquake site of the Embassy with its excellent location near the center of Tokyo, its wide approach avenue and sloping background lent itself well to a treatment which will result in a beautiful and practical ensemble. The old site has been enlarged by addition of the adjoining land, formerly property of Prince Ito at the top of the hill, and a newly acquired site, separated from the main compound by a short distance. The total area of the old grounds was 3,900 tsubo, that of the Prince Ito property 1,800 tsubo and the new land 1,050 tsubo, a total of 6,750 tsubo.

The plans call for a Chancery, Ambassador's residence, three apartment houses for the staff of the Embassy and the Consulate and garages and service buildings.

The lower compound will include the main office building and two apartment houses, a service yard with three garages, two squash courts, a swimming pool, reflecting pool and a carefully laid out garden and setting.



Proposed Office Building, American Diplomatic and Consular Establishments, Tokyo, Japan

The chancery will contain the Embassy proper, offices of the Military, Naval and Commercial Attachés and the Consulate General. This building will face toward the south along the avenue from the main road from Toranomon to Tameike with a monumental marble tile mosaic and bronze entrance and marble stairway lighted by a large l aded glass window containing a map of the United States.

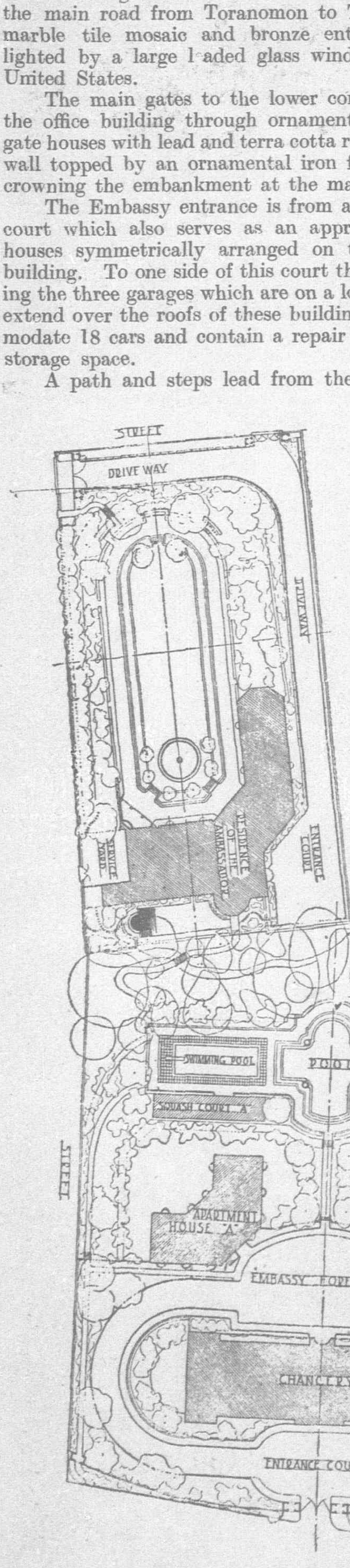
The main gates to the lower compound will lead directly to the office building through ornamental iron grill flanked by two gate houses with lead and terra cotta roofs surrounded by a concrete wall topped by an ornamental iron fence forming a graceful line crowning the embankment at the main approach side.

The Embassy entrance is from a macadam drive in the forecourt which also serves as an approach to the two apartment houses symmetrically arranged on the same axis as the office building. To one side of this court there is a service yard containing the three garages which are on a lower level so that the gardens extend over the roofs of these buildings. The garages will accommodate 18 cars and contain a repair shop, service equipment and storage space.

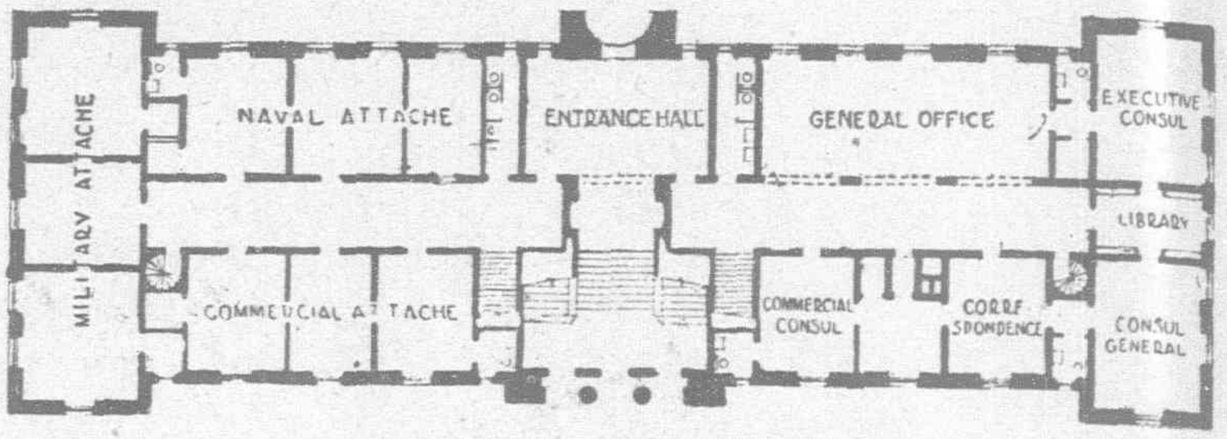
A path and steps lead from the Embassy's forecourt on the main center line of the plan to the large reflecting pool for lilies and water plants. This pool will have a rubble wall against the bank on the south side, ivy and grass borders, gravel walks, four handsome bronze lanterns and a summer house and landing on the west side.

Not only have provisions been made for the housing comfort of members of the Consulate and Embassy staffs but their physical well being has been considered by the inclusion of athletic equipment in the grounds of the lower compound. There will be a swimming pool 60 feet long and 20 feet wide, with a spring board and summer house on the east side. Water in the pool will be kept clean and fresh by a recirculating filtering system and sterilizing apparatus in the basement of one of the squash court houses. Two squash courts, laid out according to standard practice will face the swimming pool and the reflecting pool. Each will contain a court 32 feet six inches long, 17 feet wide and 18 feet six inches high and with a gallery for spectators. Special care will be taken in their construction to insure absolutely true and accurate walls and floor, the latter of which will be of specially laid hard wood over concrete. The buildings will be well heated and artificially ventilated and will have a number of showers and dressing rooms.

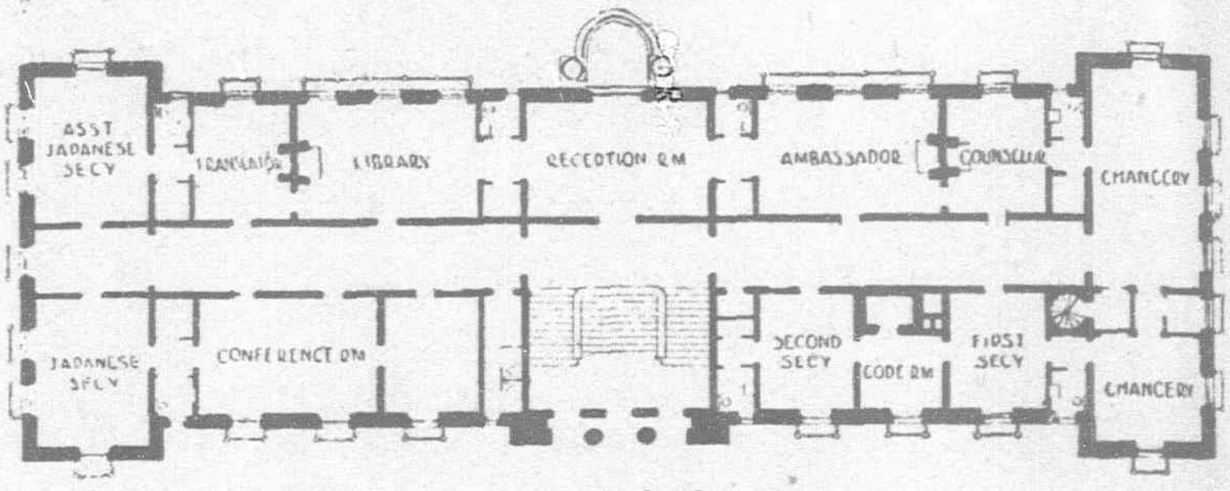
The bank which now separates the lower and upper compounds with its beautiful trees will be left in its natural state except that a walk will be built to the Ambassador's residence while the trees will be preserved with artificial rock shoring and additional wild plants and ferns planted. The rest of the compound forms a park which has been laid out with extreme



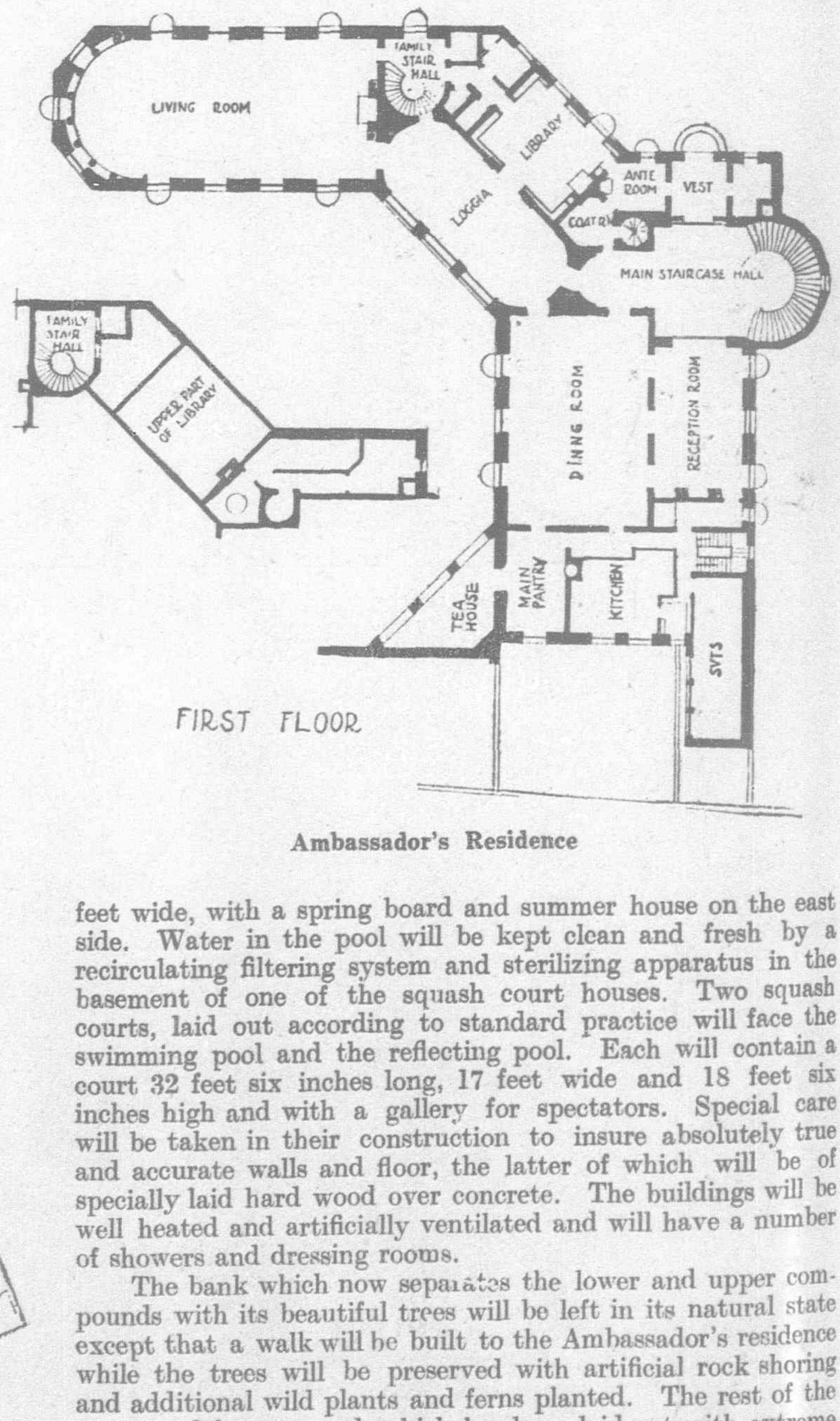
Ground Plan of American Government Property, Tokyo, Japan



Chancery Provides Office Space



Ambassador's Quarters



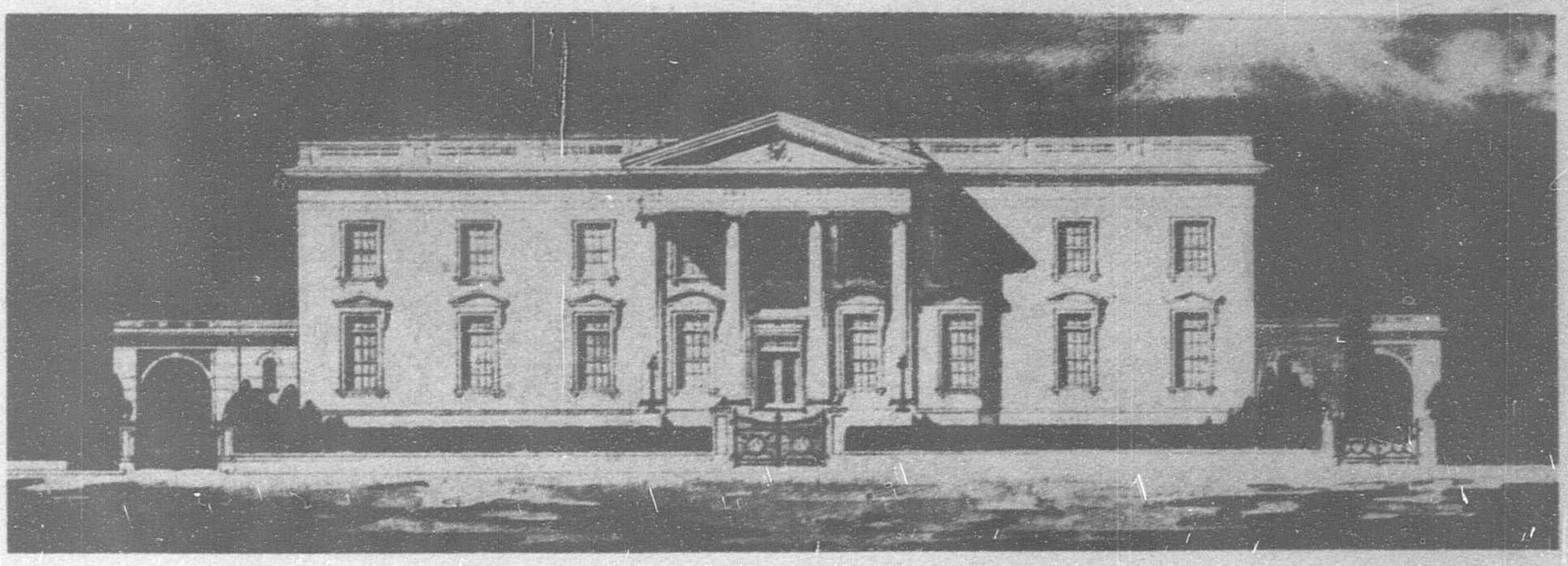
Ambassador's Residence

care to harmonize with the buildings, even the coloring and height of the trees being taken into account, as may be seen from the plot plan.

The upper compound will be devoted to the residence and garden of the Ambassador with the entrance from the south east corner of the intersection of the two roads at the top of Reinanzaka. A wide driveway skirts the edge of the area to the entrance of the residence at the northwest corner, lined with a formal line of clipped trees. This gives the grounds an air of greater spaciousness and provides a private entrance away from the main street.

The residence itself forms an irregular L with the service and garage entrance on the northeast side and level with the sloping road. On the north side there is an open terrace and private garden affording a view of the city below through the high trees of the wooded bank. To the south and east of the residence is a formal garden, the principal feature of which is the sunken garden bordered by walks, beds of shrubs and ivy and containing a large fountain. Against the high walls of trees around the driveway and toward the street specially selected trees are grouped in such a way as to lend grandeur and at the same time informality to the ensemble. All gardening is extremely carefully worked out and full advantage taken of the opportunities which Japan offers for this art.

The third divisnio of the plan which includes the separate land recently acquired is on the same street leading up from the bottom of the hill and 200 feet to the south of the entrance of the grounds of the residence. A large apartment house to contain the living quarters of all the senior officers of both the Embassy and Consular establishments will be erected here. The general plan, drawings and specifications for this building are not ready and were not given out for bids at the same time as the main plan and will not be included in that contract.



Proposed American Consulate, Yokohama, Japan

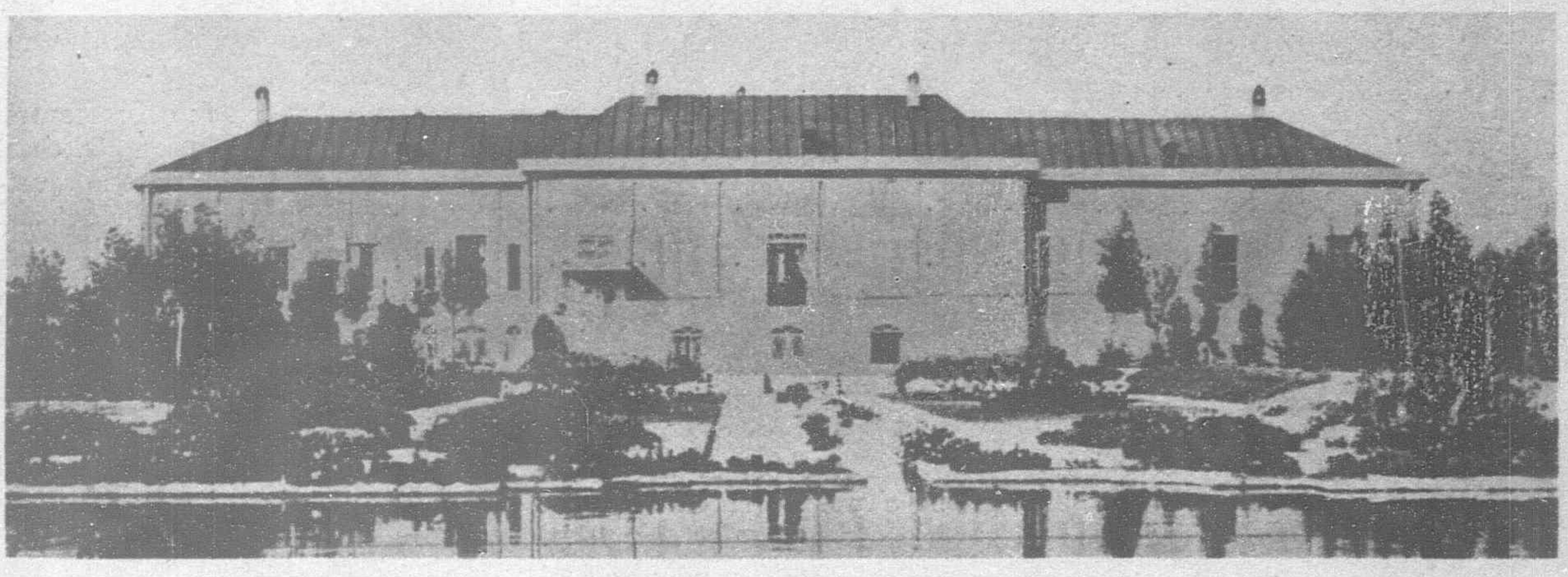
The modern Spanish renaissance effect of the buildings is given by the exterior walls dressed with white stucco with an ornamental stucco band as the cornice. There will be projecting copper eaves over the second floor windows and the round arches over the first floor openings of the Ambassador's residence are to be of graded colored tile mosaic.

Wrought and cast iron and bronze grills are used in appropriate places, which together with the bronze arms of the United States and the steel sash, will add to the colorfulness of the conception. Marble and colored terra cotta and terra cotta ornaments give accent to the desired places.

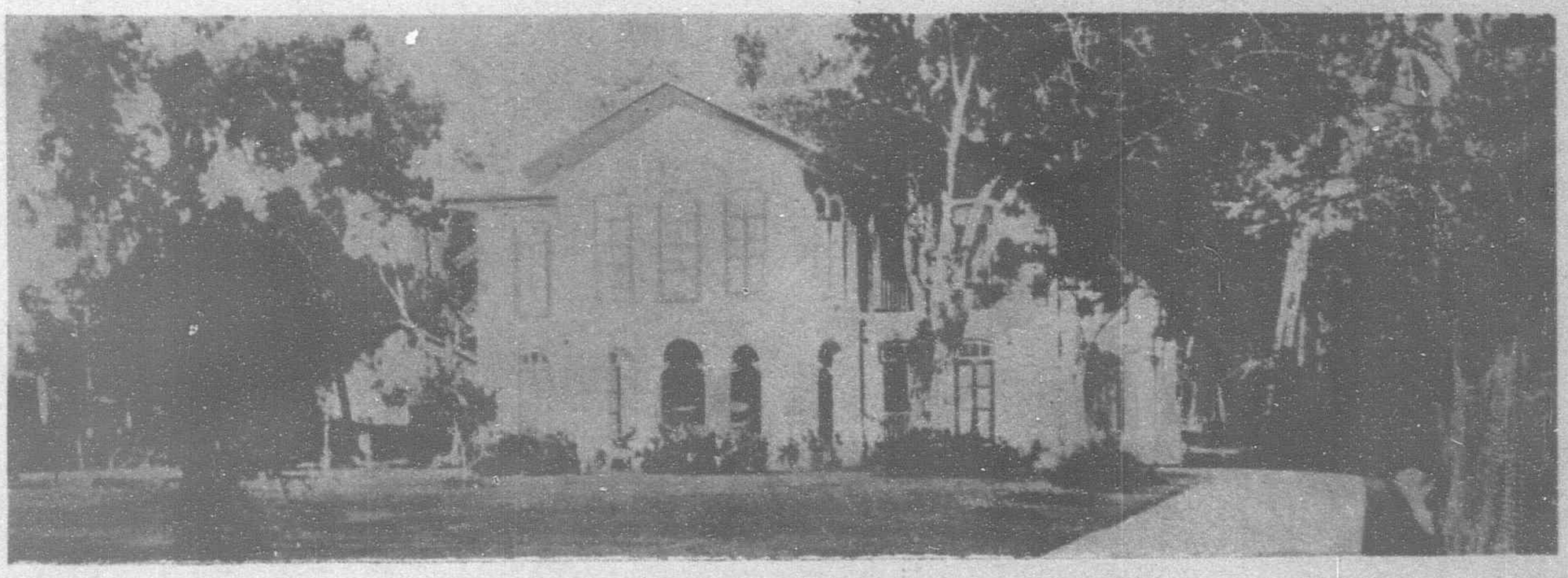
All construction is earthquake and fireproof, designed by Friedman and Cohen, New York structural engineers, reinforced concrete throughout, with the foundation partly raft only and partly resting on reinforced concrete piles.

The mechanical equipment consists mainly of two boiler rooms, one under the Ambassador's residence and another under the chancery, equipped with the latest of oil burning heating boilers, hot water heaters, pumps, automatic temperature control, electric refrigeration and other apparatus. This work was designed by Clark, MacMullen and Riley, heating, ventilating, mechanical and sanitary engineers of New York City.

Several fan systems are provided for ventilation and the plumbing consists of septic tanks, complete sanitary drainage systems, tanks and gas supply.



American Legation, Teheran, Persia

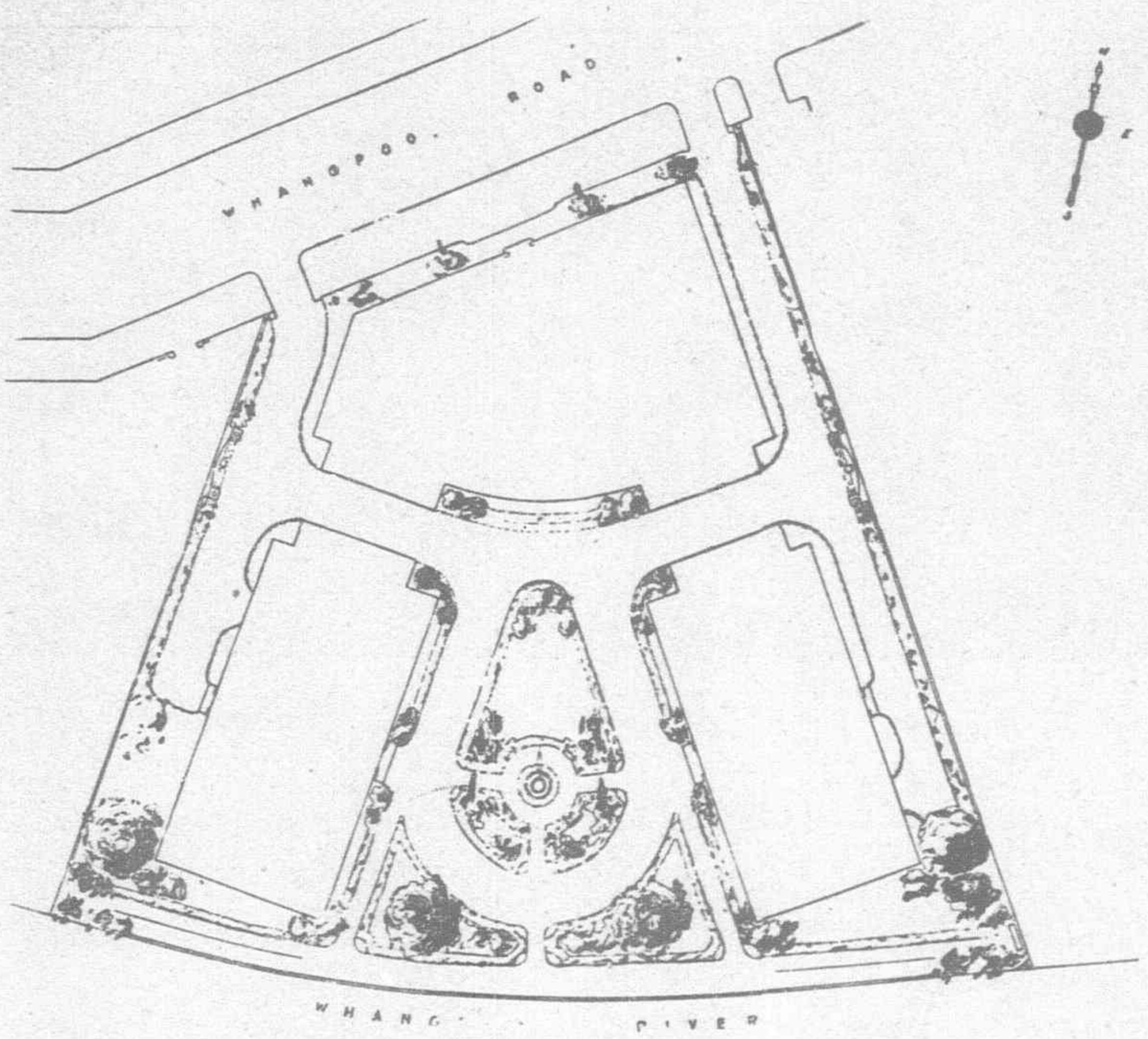


New American Consulate, Penang, Straits Settlements

Electrical equipment includes wiring for light and power, transformers for stepping down the high voltage current for household uses and other conveniences designed according to the latest standards.

A complete automatic telephone and signal system will also be installed and an elevator provided for the Ambassador's residence.

The Embassy office in the chancery consists of a reception room 30 by 20 feet, Ambassador's office 30 by 20 feet, library 30 feet square, Counselor's office, offices for the first and second secretary with a code room and vault, a chancery 35 by 20 feet and another 20 feet square, a large conference room and offices for the Japanese secretary and an assistant Japanese secretary. All rooms have high ceilings, rolling insect screens on the windows and are handsomely decorated.



Lay-out of Proposed Shanghai Consulate

The Ambassador's office and the library are beautifully paneled in American walnut.

The entrance to the Consulate General is on the north side situated on the ground floor and the first floor. The rooms on the ground floor include a general office 47 by 20 feet, executive Consul's office, a library and Consulate General's office 25 by 20 feet. A commercial Consul's office with vault and correspondence room complete this section.

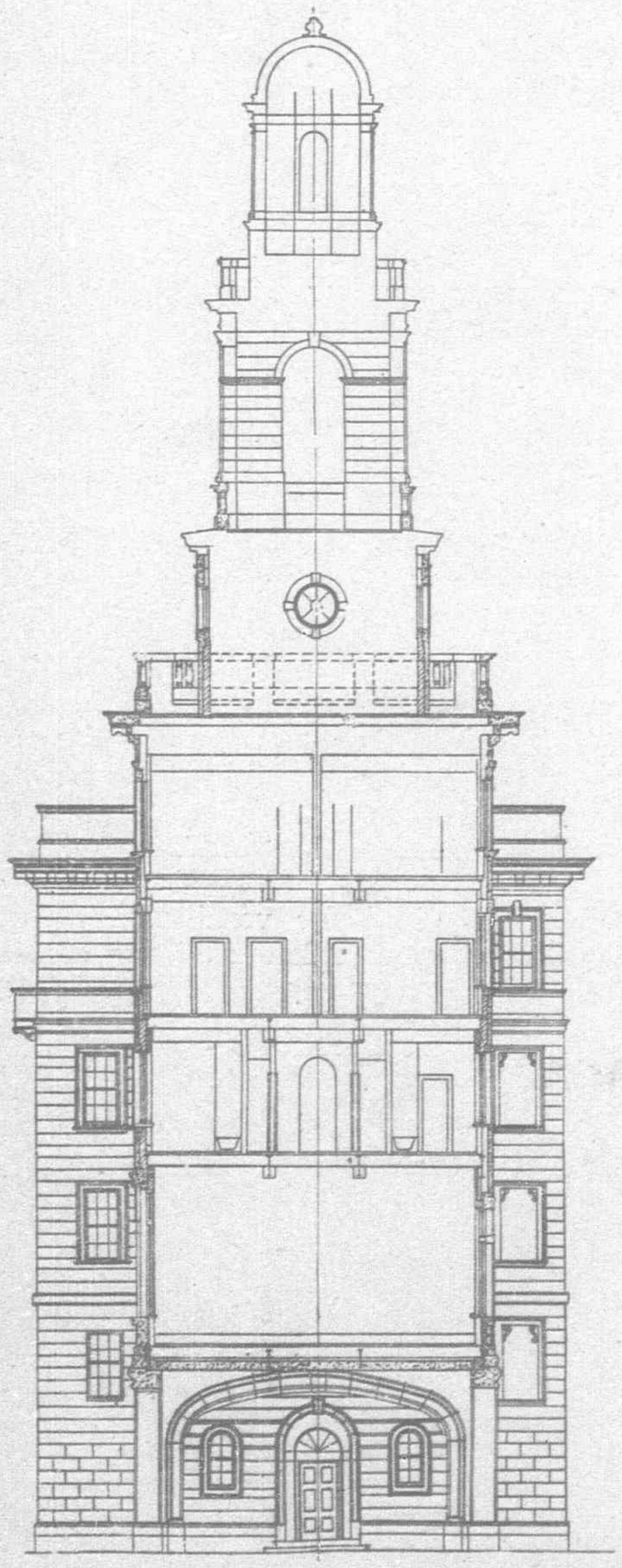
The Commercial Attaché's office consists of a waiting room, general office 47 by 20 feet, large offices for report officers, a mailing room and supplies room on the ground floor and three large offices for the use of the Commercial Attaché's department on the next floor.

The final housing scheme provides for every officer and employee of the Embassy and Consulate, but the present stage includes only nine apartments in two buildings.

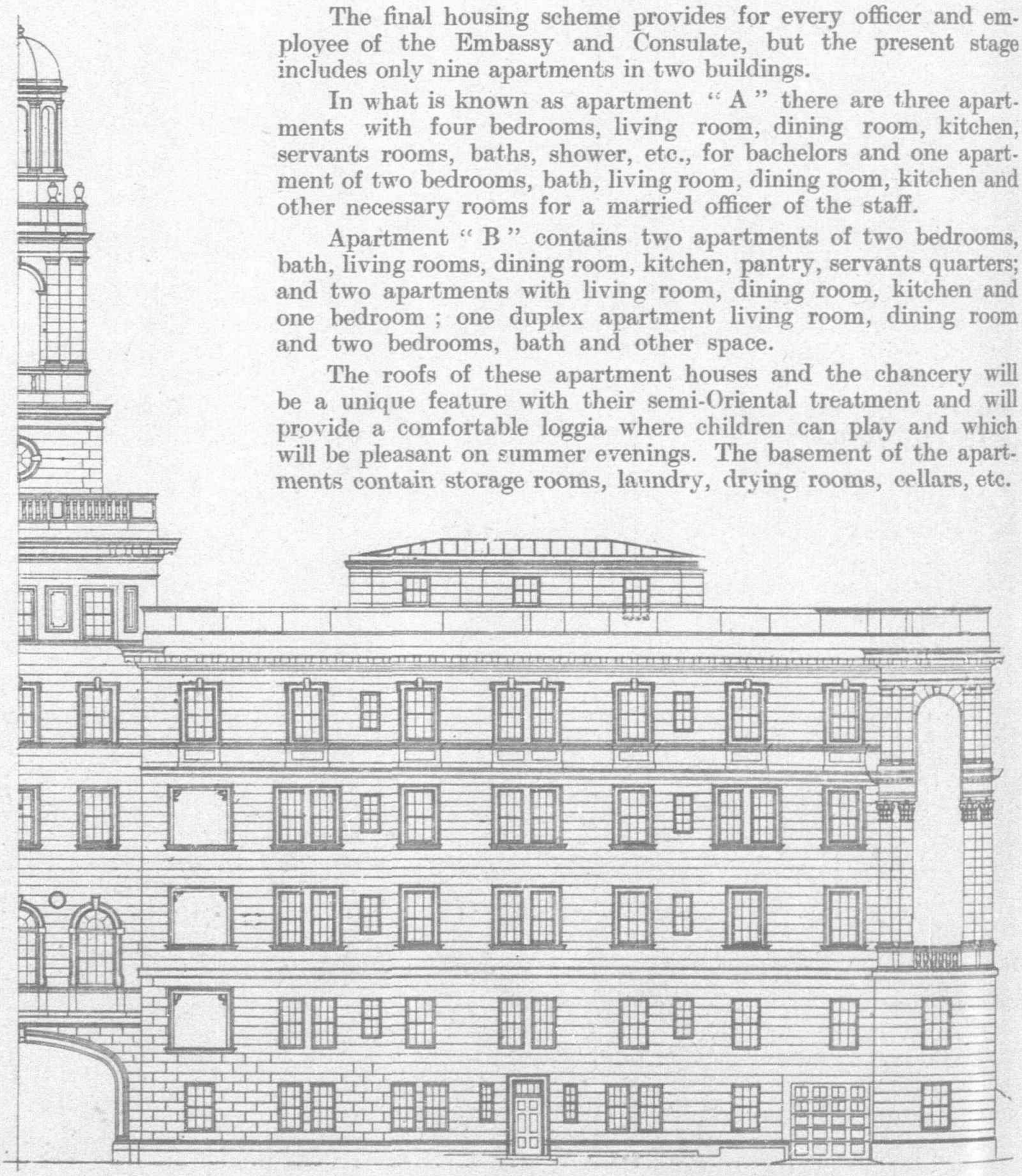
In what is known as apartment "A" there are three apartments with four bedrooms, living room, dining room, kitchen, servants rooms, baths, shower, etc., for bachelors and one apartment of two bedrooms, bath, living room, dining room, kitchen and other necessary rooms for a married officer of the staff.

Apartment "B" contains two apartments of two bedrooms, bath, living rooms, dining room, kitchen, pantry, servants quarters; and two apartments with living room, dining room, kitchen and one bedroom; one duplex apartment living room, dining room and two bedrooms, bath and other space.

The roofs of these apartment houses and the chancery will be a unique feature with their semi-Oriental treatment and will provide a comfortable loggia where children can play and which will be pleasant on summer evenings. The basement of the apartments contain storage rooms, laundry, drying rooms, cellars, etc.

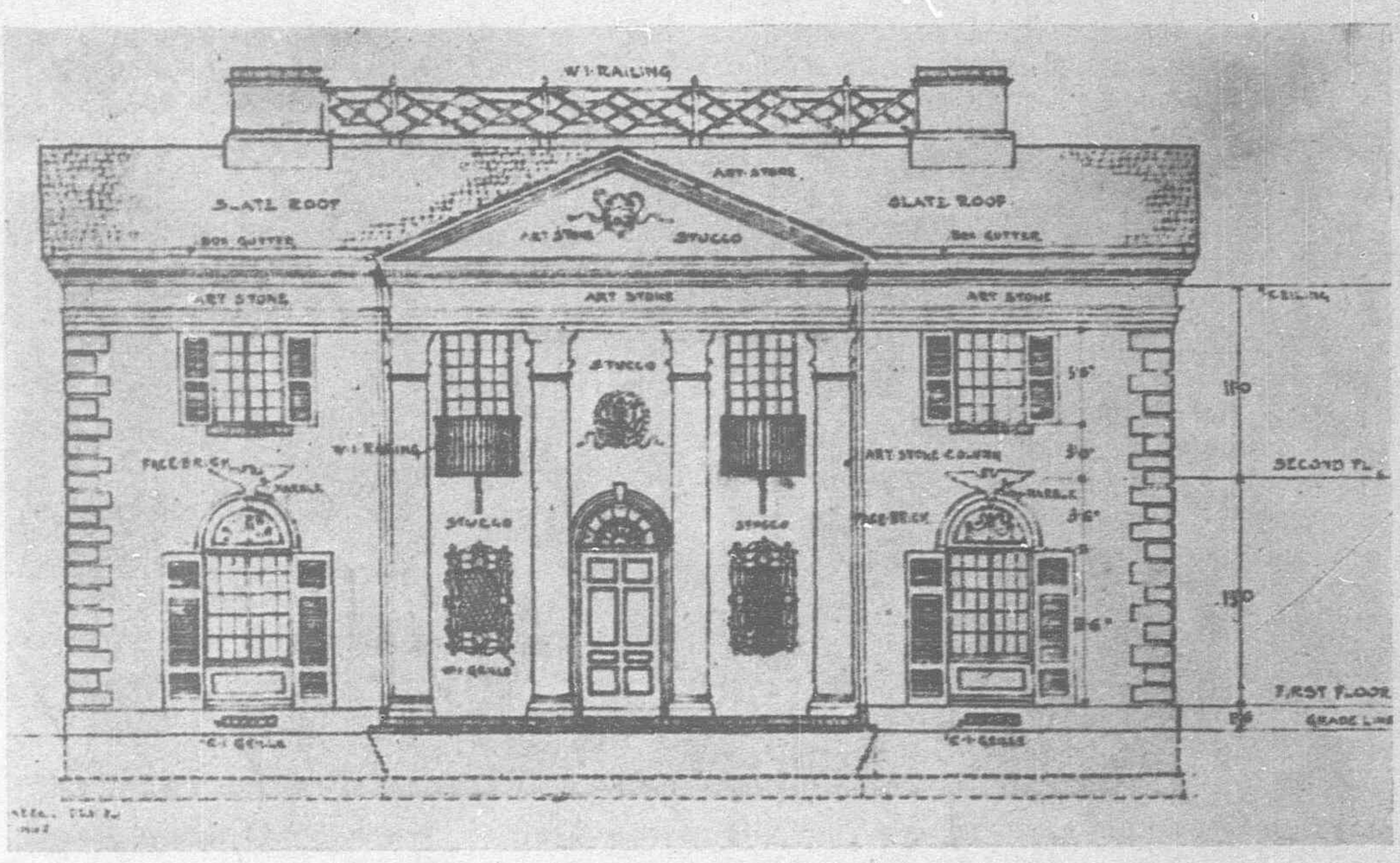


Section Through Tower Toward Apartment Unit



Rear Elevation

ELEVATIONS APARTMENT UNIT
UNITED STATES CONSULATE
SHANGHAI, CHINA
ROBERT MAURICE TRIMBLE, ARCHITECT



Facade of American Consulate, Amoy, China

In designing the residence of the Ambassador the feeling of a private residence was carried out and well preserved in this large building, while at the same time it is admirably adapted both for living and official purposes.

A wooden grill separates the vestibule from the main staircase hall, with a graceful circular marble stairway leading to a mezzanine and the upper floor. Another wooden grill separates the stair hall from the reception room, which is 30 by 20 feet in area. From the reception room there are three large doors to the dining room on the south side and three doors to the terrace garden on the north side.

The spacious dining room is 43 by 30 feet with a door on the west side leading to a loggia of elliptical shape about 40 by 20 feet serving as an ante room to the library and the living room.

The library is a stately paneled room extending the full height of the two floors which can be used as a smoking room for receptions and other functions.

The large living room of 64 by 30 feet will serve as a ball room and for large official receptions and other social affairs.

Other features of the residence include a fountain decorated terrace, a tea house, ante rooms, cloak rooms, pantries, kitchen and other space necessary in such an establishment.

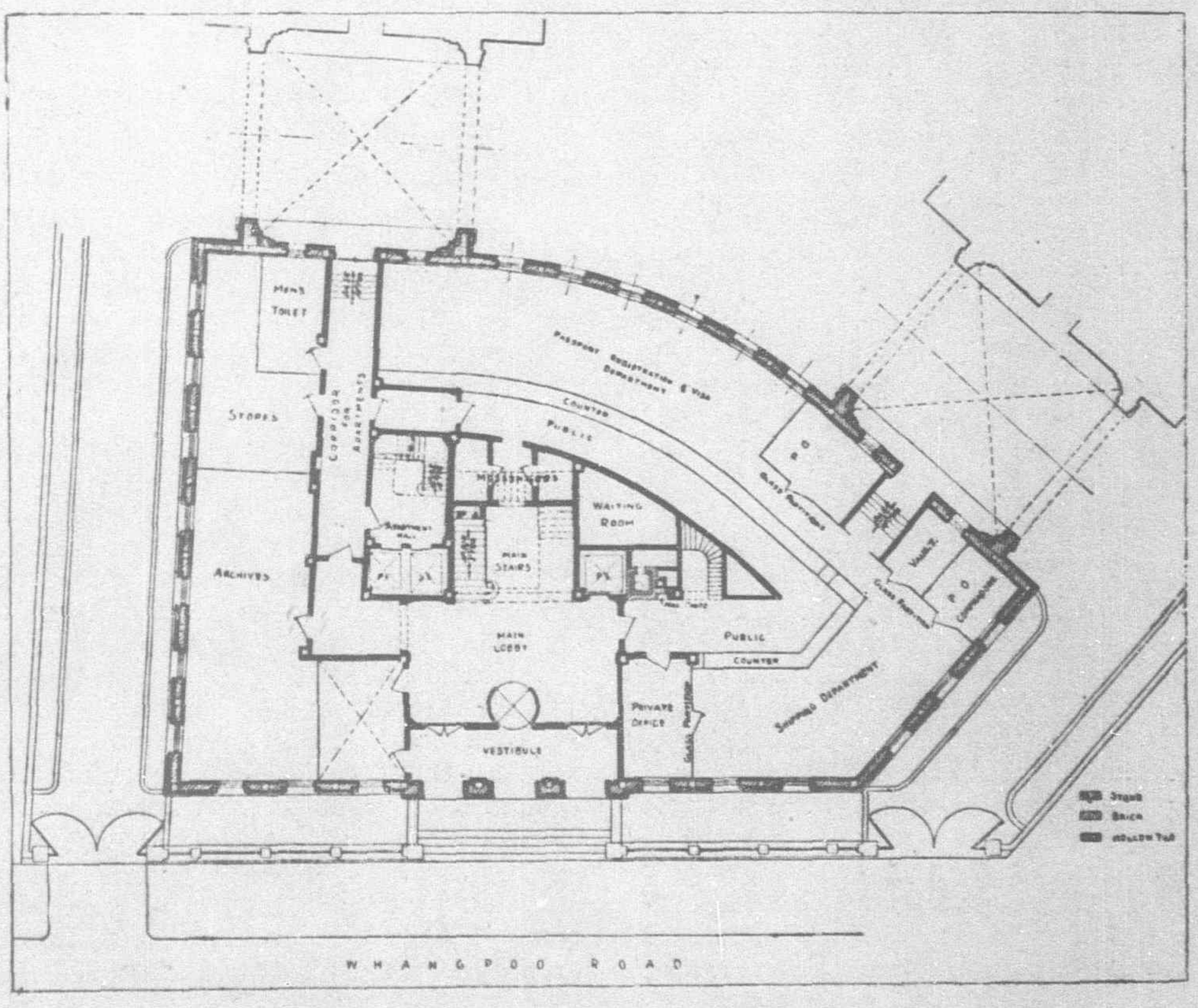
The second floor of the building is given over to the living quarters of the Ambassador including a breakfast and sitting room on the north side, seven principal bedrooms, bathrooms, ladies' dressing room, valet's room, serving room, linen room, etc., and rooms for foreign servants. Large cellars, storage space and the service wing containing garages for four cars, servants dining and living room provide ample space for the domestic staff.

There are open fireplaces in three bedrooms, sitting room, reception room, dining room, living room and the library.

Ceilings and walls in many of the rooms are richly paneled and American, Japanese, Formosan and Italian marbles extensively used in the building.

Many of the finishing materials will be imported from the United States and a large amount of this will even be worked there and shipped ready to set up here.

The lumber used for the rough carpentry will be southern yellow pine and douglas fir and for finishing work American white pine, ash, birch and walnut will be employed. Floors will be of teak parquet throughout.



Teheran Legation

At its second meeting, the Commission allocated $90,000 for the purchase of the building now occupied by the American Legation at Teheran, Persia, and the initial remodeling, repair and furnishing thereof. The American Minister now reportsthe purchase of the property at a cost of $59,348. Plans for its remodeling and repair will go forward as promptly as possible.

Yokohama Consulate

On March 30, 1927, the commission approved the allocation of $150,000 for the construction of buildings to provide residential and office quarters for the American consul in Yokohama and his American staff. It was further decided to authorize the exchange of the lot owned by this Government in Yokohama for a larger lot overlooking the Bay, subject to ratification of Congress. This ratification was made by Congress when it amended the Foreign Service Buildings Act by giving the commission general powers to exchange properties, and the American Consul at Yokohama has reported that the exchange has been completed. Mr. J. H. Morgan, an American architect residing in Yokohama, drew the preliminary plans for the building which were submitted to and approved by the commission in March, 1927. The plans have been submitted to the Supervising Architect and have been approved by this office with certain changes, which have been made. The architect is now preparing working drawings and specifications, and construction will be pushed as rapidly as possible.

Penang Consulate

The sum of $35,000 was allocated by the commission for the acquisition, remodeling, repair and furnishing of a consular building at Penang. Property comprising 62,055 square feet of land and suitable buildings were purchased for $21,162 and repairs to the main building, and grounds have been completed with

the exception of sanitation, which is authorized. Complete furnishings for the building have been acquired and there will be a saving of approximately $3,000 on the allocation. As far as possible the furniture selected was of steel and aluminum, materials calculated to be impervious to the ravages of the white ant.

Bangkok Legation

The expenditure of $100,000 was authorized by the commission for the construction and initial furnishing of a new building in Bangkok, Siam, to replace the present American Legation which has been seriously damaged by white ants. Plans for this work will go forward immediately upon further authorization. An additional $17,000 was allocated by the commission for the acquisition of adjoining land to round out the present holding. This adjoining property has been acquired for $12,200, effecting a saving of $4,799 on the allocation.

Calcutta Consulate

On October 17, 1927, the sum of $500,000 was allocated for the purchase of two plots of ground and the construction of an American office building and a residence in Calcutta for the American consulate-general and American trade commissioners. A site has been bought for $72,995 for an office building and a residential site for $80,774. Preliminary plans for both office building and residence, prepared by Calcutta architects under the direction of the consul general, were worked into practical form by the Supervising Architect's office and approved by the consul general. They will be completed upon the return to the United States of Mr. Robert Maurice Trimble, who is now in Calcutta to gather information which will enable him to act as consulting architect for this project.

Shanghai Consulate General

At the commission's third meeting $750,000 was allocated for the demolition of the present Government-owned building at Shanghai and the erection of a new structure on the same site. Mr. Robert Maurice Trimble was designated as the architect, and his preliminary sketches of the building have been completed and approved by the commission. The Whangpoo Conservancy Board authorized the construction of an extended retaining wall which will add approximately 4,350 square feet to the present water front of the consulate. This will give a pleasing lawn on the river side of the building, which is important as it is the view of the property seen by arrivals coming up the river to the port.

Mr. E. S. Cunningham, American Consul-General in Shanghai, when consulting with the architect, who visited Shanghai for the purpose, suggested changes in the plan of the first floor and in some of the other arrangements. These changes increase the efficiency of the office operation as there is a continuous, glass-enclosed counter, at which business may be transacted with a maximum of speed and a minimum of effort. Permanent savings were also effected in the electrical equipment.

Mukden Consulate

The commission allocated $75,000 for the purpose of constructing on the site owned by the American Government at Mukden, a building to provide offices and residential quarters for the American officials stationed there. Plans for this structure are now being considered.

Nagasaki Consulate

On October 17, 1927, $20,000 was allocated for the acquisition and initial repair, remodeling and furnishing of a consular building at Nagasaki, and a property on the water front was therefore purchased for $12,986. The structure is being repaired and refurnished. Since the purchase of this property, the American consul at Nagasaki has reported the purchase by the Nippon Yusen Kaisha, for $20,227, of the property at No. 4 Oura, which is separated from the new consular property by a narrow street and has the same frontage and area. The fact that the leading steamship company of Japan has paid 55 per cent. more for inferior buildings than was paid for the consular property shows that not only was the latter acquired on very favorable terms, but that there has already taken place a substantial increase in the value of the Government's investment in Nagasaki.

Aden Consulate

Eighteen thousand dollars was allocated for the acquisition at Aden, Arabia, of a site with a view to the future erection of a suitable American consular building. The consul at Aden has reported the successful negotiations for a site comprising approximately three-quarters of an acre, located on the water front, effecting a saving of $1,643 on the total allocation. Preliminary studies for a consular building are being prepared for the consideration of the commission.

Nanking Embassy

As yet, the American Government has arrived at no decision concerning the transfer of its legation from Peping to Nanking. When the time arrives when the American Government decides to move the Legation, a large allocation of funds adequately to house the American Embassy and its group of attachés, will have to be made.

Book Notes

(Continued from page 447)

GENERAL STATEMENT ON THE MINING INDUSTRY OF HUNAN, by C. P. Liu, S. Y. Kuo and H. C. Hsin. Geological Survey of Hunan Series, Bulletin 6, Special Report 2. May, 1929.

This is a valuable compendium of exhaustive information on mining in Hunan Province. Hunan is extremely wealthy in mineral resources. It has gold, silver, lead and zinc, copper, iron, manganese, tin, arsenic, antimony, mercury, tungsten, bismuth and molybdenum in the metal group, and coal, sulphur, graphite, salt and gypsum in the non-metal group. This volume deals in details with every one of the enumerated products, showing its distribution, general condition and production.

There are statistics and information in this volume which should be interesting even to non-technical readers. Hunan, for instance, has the largest production of antimony in the world and in the production of lead and zinc, manganese, arsenic and sulphur, it ranks first among the provinces of China. The commercial side, dealing with marketing, import and export of the more important products, is also fully discussed, which immeasurably increases the bulletin's usefulness.

The volume is fully illustrated by diagrams, charts, tables and maps, there being more than 200 of them.—Y. L. T.

Petter Oil and Petrol Engines

We have received a very interesting catalogue from Messrs. Petters, Limited. The introduction to the catalogue is as follows:

> Many manufacturers of machinery for various trades and industries have adopted Petter Engines as the standard motive power units for building into their plants.
>
> In this booklet are illustrated a few examples of combination plants by prominent manufacturers is which Petter Engines have been embodied in this way.
>
> This necessarily limited selection will, it is hoped, demonstrate the wide application of Petter Oil and Petrol Engines, and will serve to indicate their adaptability to all kinds of machines and for service under all sorts of conditions.
>
> We invite enquiries from manufacturers and users of power in every industry. Where a standard Petter Engine cannot be used, we can in nearly all cases suggest such minor modifications as different types of drive, the addition of suitable clutches or reduction gearing, the fitting of radiators in place of water cooling tanks, etc., which will enable the engine to be incorporated in the plant.
>
> Our technical departments have very wide experience of all such problems, and our assistance will gladly be given in connection with the design of combination plants for every purpose.

Full particulars of any of the plants illustrated in this list can be obtained either direct from the manufacturers whose names are given, or from Petters Limited.

Canton Automatic Telephone System

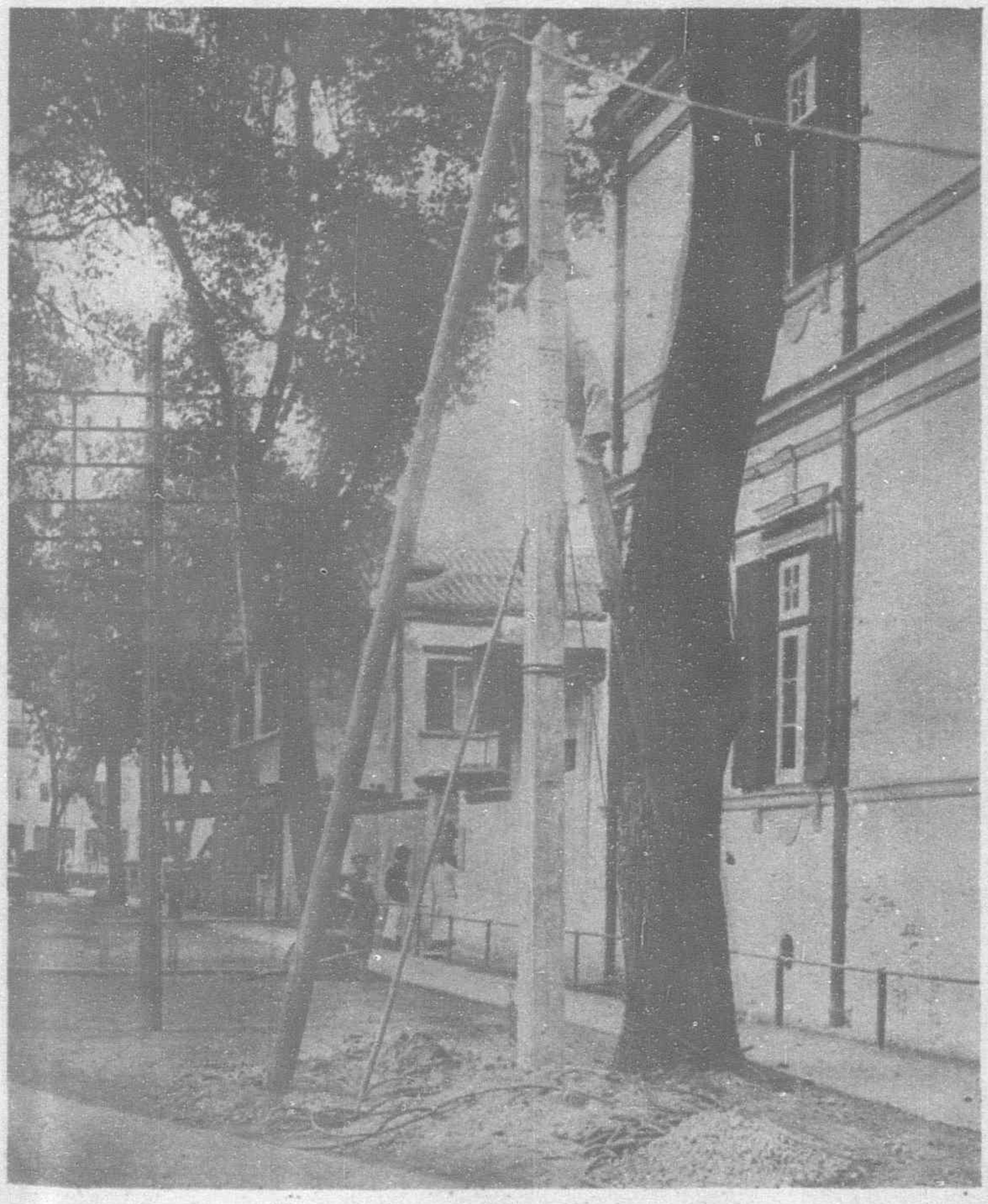
UNDOUBTEDLY the greatest Municipal achievement of the Canton Municipality is the recent installation of a new and modern automatic telephone system at a cost of nearly U.S. $700,000. The contract for the new telephone exchange, which included the erection of a new exchange building and the installation of a complete outside plant, was placed with the China Electric Company late in March 1928.

Intensive efforts were soon made to provide the city of Canton with an entire new telephone plant, a task which involved not only the substitution of automatic for manual exchange service, but also the erection of exchange buildings, a planning of distribution systems that would serve as a foundation for all future plant extension and the construction of an underground and aerial cable network. The task, however, was completed and the exchange put in operation on August 25, 1929, in the exceptionally short period of less than 15 months after work was started. The entire project was installed by Chinese workmen under the direction of Chinese engineers with the assistance of four foreign engineers, two of whom were concerned wholly with the installation of the automatic exchange equipment.

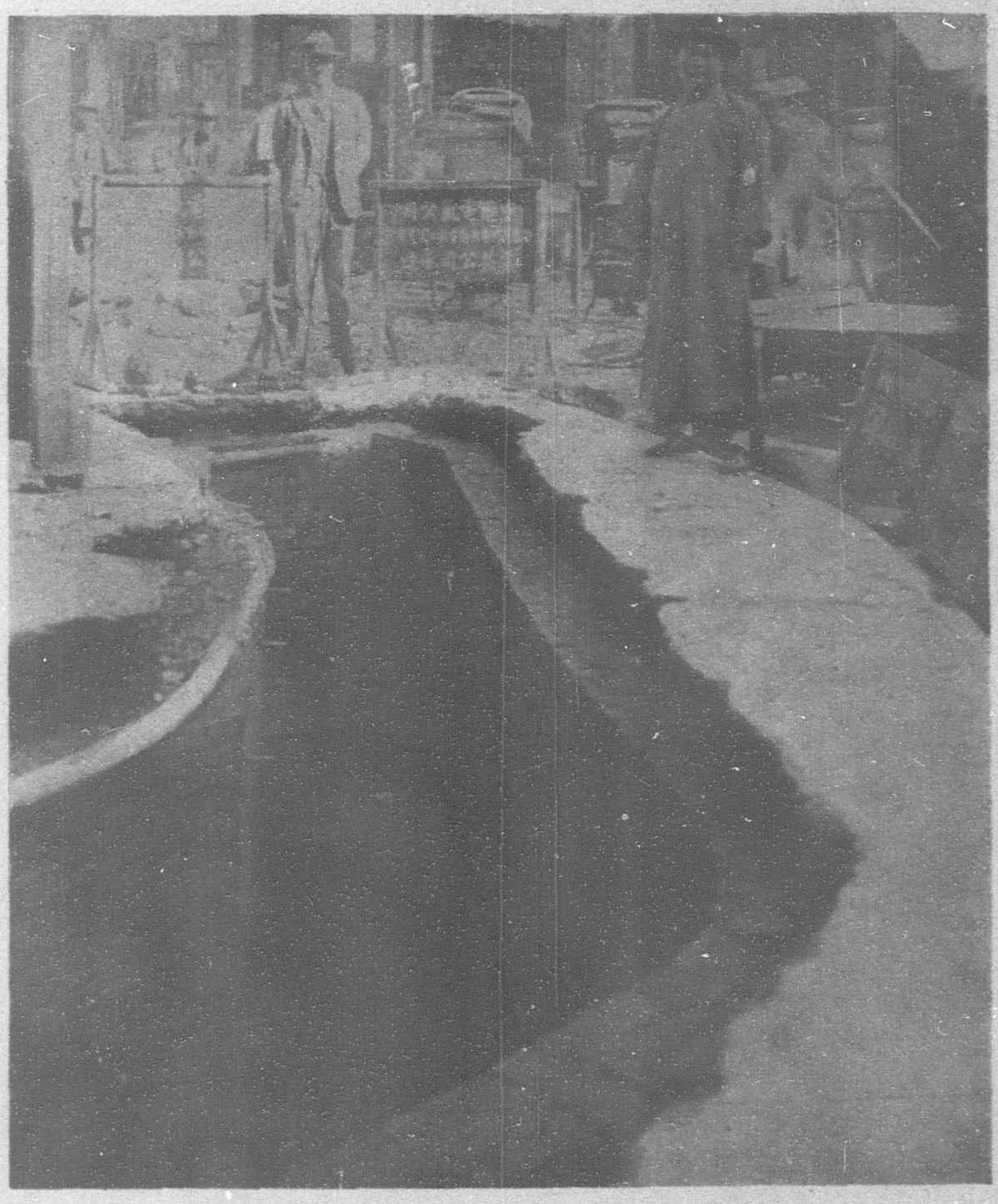
Central Exchange Building

The outside plant construction involved the manufacture and laying of over 110,000 feet of underground duct, the placing of nearly 200,000 feet of telephone cable and the stringing of over 1,000,000 feet of insulated telephone wire. In addition, over 600 concrete poles were used in the construction of the plant.

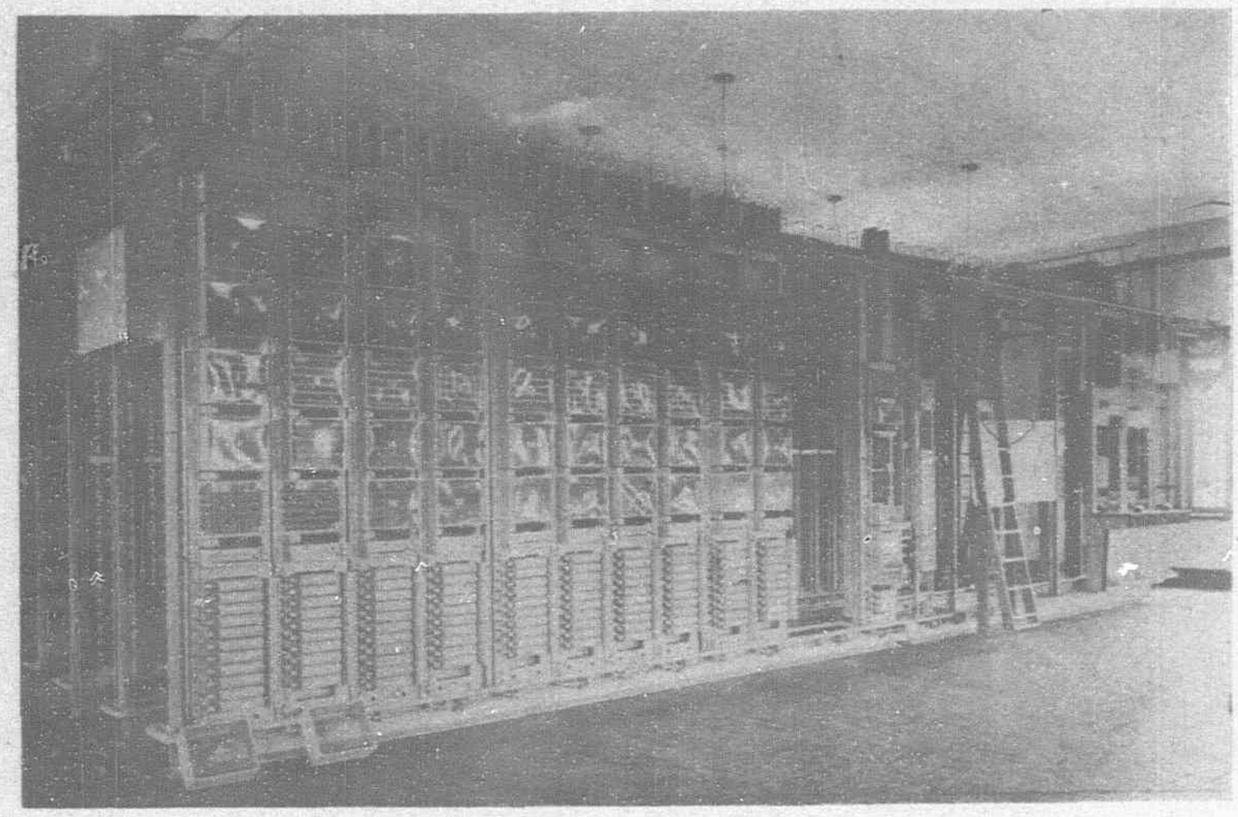
The automatic exchange equipment is of the Standard Electric Rotary Machine Switching type. The system comprises two exchanges, a 4,000 line central unit with an ultimate capacity of 10,000 lines serving Canton proper and the foreign community of Shameen, and a branch exchange of 300



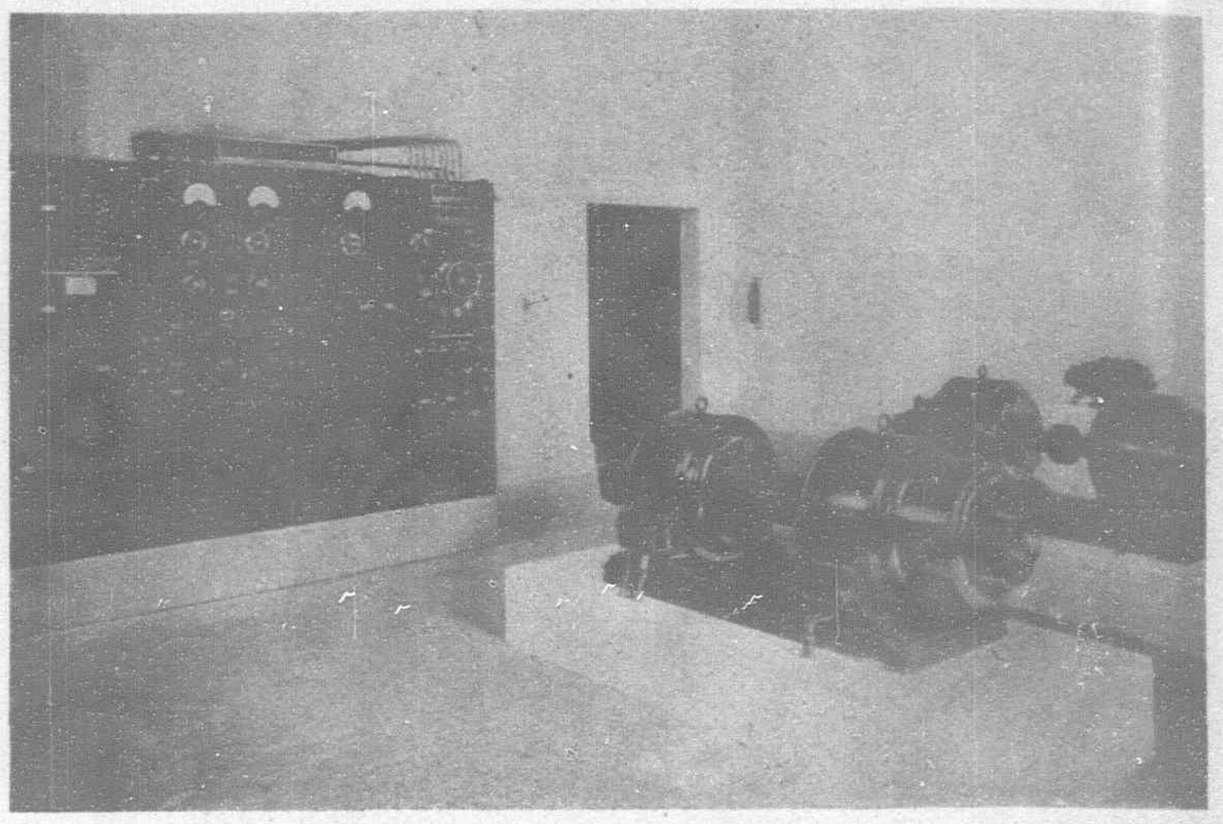
Erecting Concrete Pole



Special Man Hole—Underground Cable System



Central Exchange, Registers and Sequence Switches

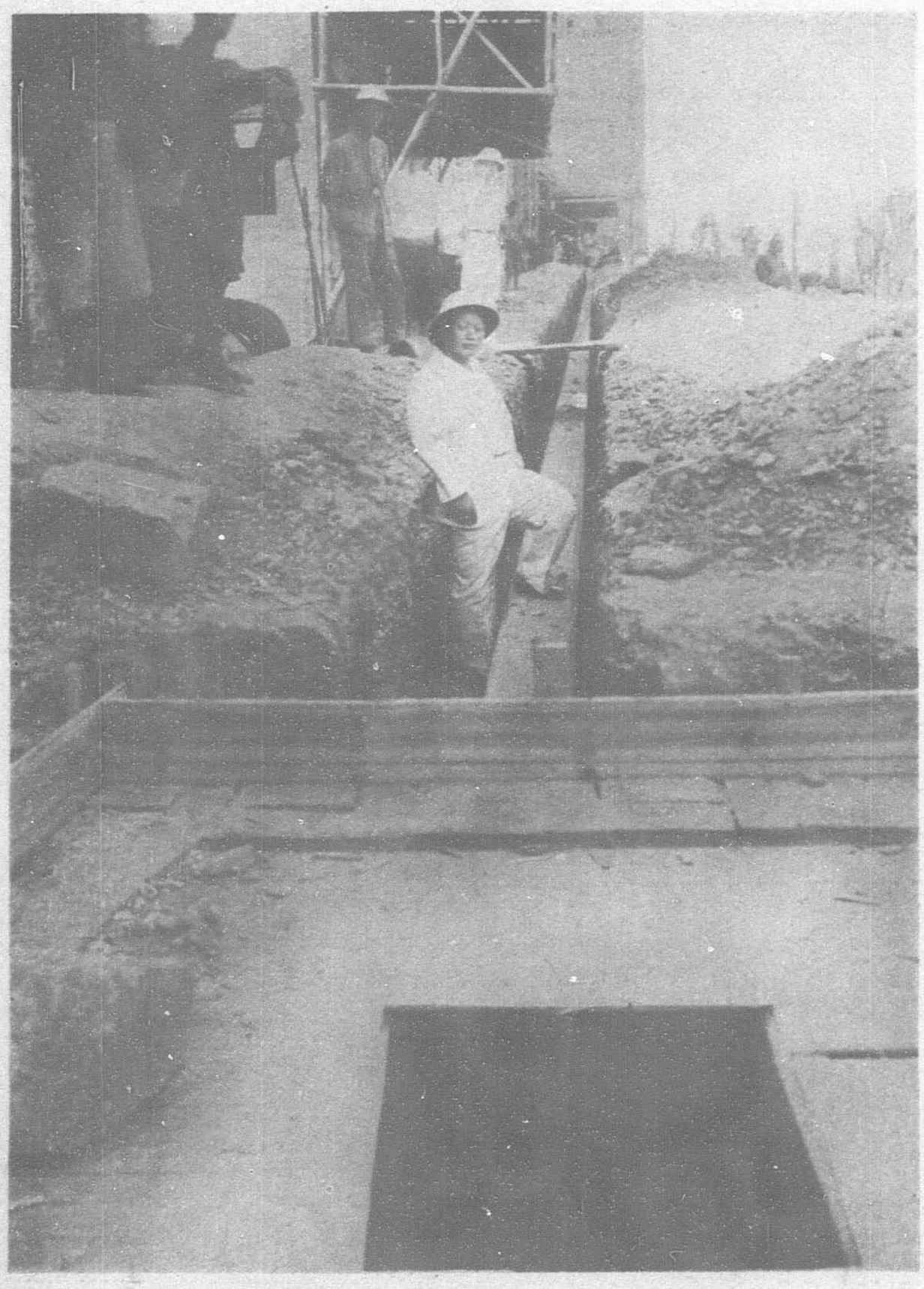


Central Exchange Power Room Showing, Switchboard, Charging Sets, Etc.

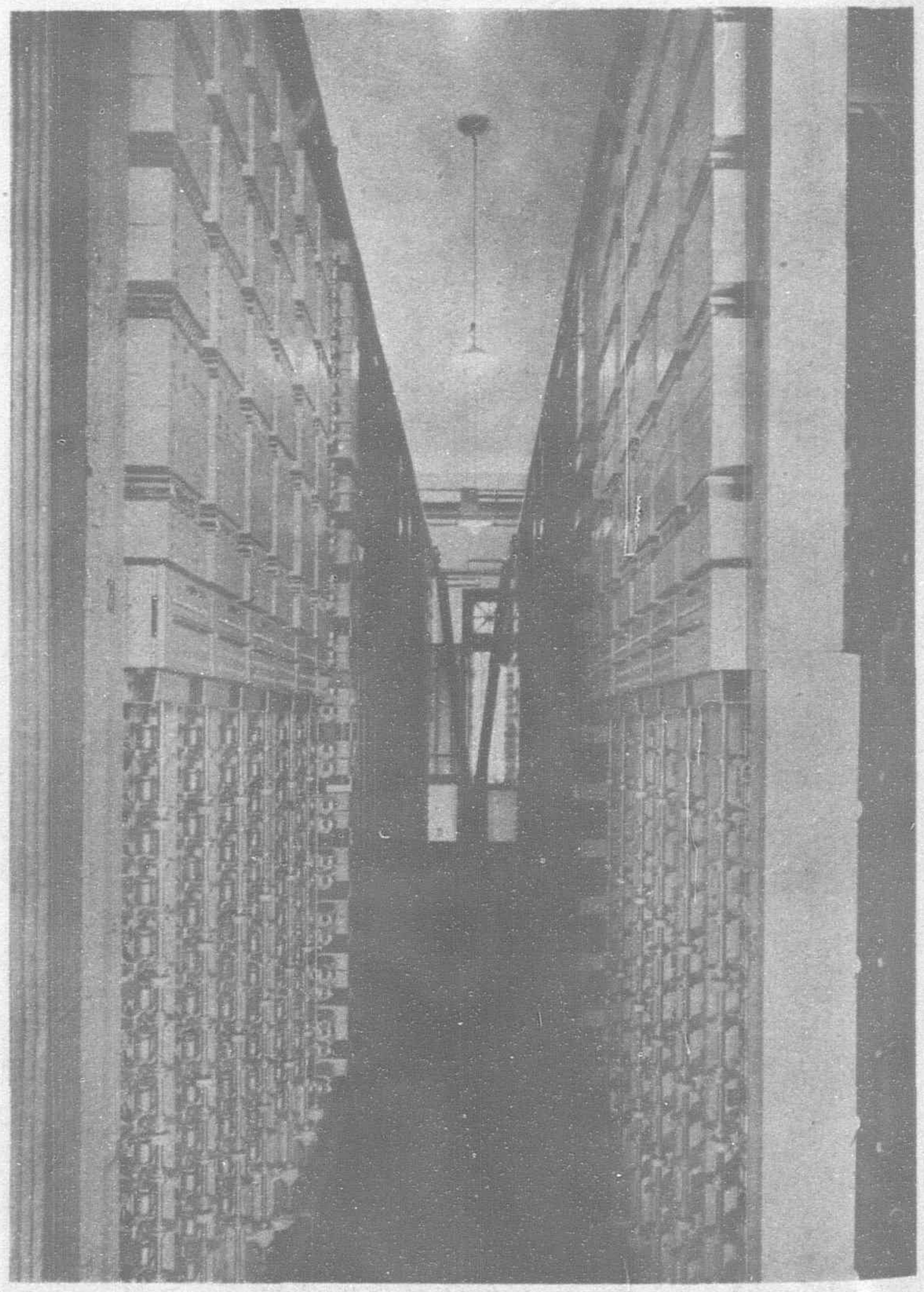
lines with an ultimate capacity of 800 lines located on the island of Honam. The exchanges are connected by a 50 pair submarine junction cable laid in the Pearl River.

The main exchange building situated in Taiping Road is of reinforced concrete construction, two stories high with a half basement. All of the automatic equipment is located on the second floor in which there is ample room for an ultimate capacity of 10,000 lines. The main frame is directly below on the first floor. There is also on this floor, the necessary charging equipment, ringing machines, storage batteries and test desks. The climate of Canton is severe with high humidity during many months of the year. This condition naturally calls for specially treated equipment throughout including anti-rust treatment of all metal work, enamelled conductors and impregnated insulation of all cables. In addition to the special treatment of all apparatus, air conditioning equipment is being installed which will maintain a temperature of less than 80°F at a relative humidity of 60 per cent. under extreme conditions. This equipment is being installed in the basement where there is also storage space and a cable vault through which all cables of the system enter the building.

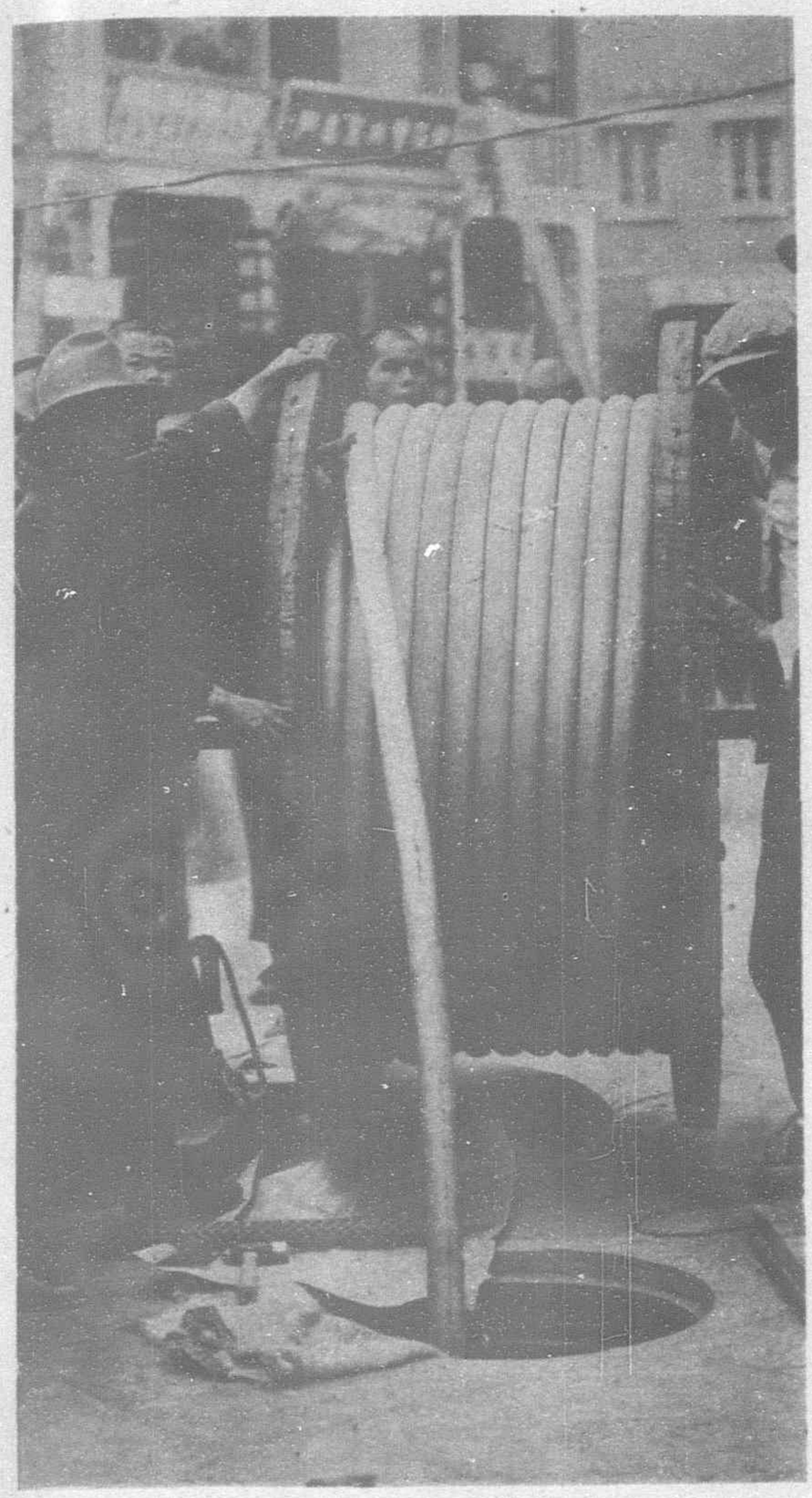
The distinctive feature of the automatic equipment is that all line finders, sequence switches and selectors are gear driven. The



Laying Concrete Ducts System



Central Exchange—Registers and First Line Finders



Laying Underground Cable

circuits used contain many new features such as the "hold over" circuit for registers and the automatic release of a register, if held for more than 30 seconds without dialing. Routine testing equipment for line finders, selectors and registers is provided, together with complete facilities for monitoring and testing subscribers' lines. The subscribers' lines are cabled from the M.D.F. to terminal strips mounted above the final selector bays, and from there to the final selector arcs. The subscribers' lines are connected to the line relays and line finder arcs by means of jumpers from the final terminal strips to the line finder terminal strips, these being, in effect, an I.D.F. for distributing the subscribers' lines to the line finder groups as traffic conditions require.

In the ultimate stage of the Central exchange, facilities for 50,000 lines in the complete area are provided. Five levels of the first group selectors at Central will each have access *via* third group selectors and finals to 2,000 subscribers' lines. One level will be used for special services *via* second group selectors, whereas to the four remaining levels, junctions may be connected leading to four 10,000 line exchanges. Should the numbering capacity of 10,000 lines for the Central exchange eventually be too small, a second unit of 10,000 lines may be added to the Central exchange capacity. Special services are numbered as follows :—

Toll	00
Complaint	01
Test clerk	02
Information	03
Monitoring	04

The special service operators' positions are located at Central exchange. In case the number of subscribers in the Canton area increases over 50,000, the capacity for the Canton area may be increased to 90,000 numbers by making a small change in the registers and by introducing second group selectors in the exchanges then existing.

In both Central and Honam exchanges, certain groups of subscribers' lines are reserved for private branch exchanges and are equipped with special finder selectors designed for P.B.X. hunting. As the calling rate in these groups are naturally higher, a greater number of final selectors is provided.

The power equipment at Central exchange includes two 48 volt 960 ampere hour storage batteries with tank capacity of 3,360 ampere hours consisting of 25 cells each. The charging equipment consists of two motor driven compound wound generators with a capacity of 275 amperes at 60 volts, so arranged that they can charge the batteries or float the load singly or in parallel.

The switch rack motors are of the Duplex type, one set of windings arranged for 220 volt 60 cycle A.C. and the other set for 48 volt D.C. The motors are normally operated from commercial power supply but in the event of failure, are automatically connected to the 48 volt D.C. source. On resumption of the commercial supply, the motors are automatically disconnected from the 48 volt system and connected to the commercial supply.

Desk or wall telephone sets with hand-sets or micro-telephones are used exclusively and the dials are marked with Chinese characters. The new instruments were installed alongside the old magneto telephones which remained in service until the new exchange was cutover.

Over half of the outside plant is carried in concrete ducts laid underground. Two sizes of duct blocks were used, one of 6-way and one 3-way. These ducts were made locally, there being required, 5,600 of the 6-way blocks and 1,400 of the 3-way. The 6-way blocks are 3-ft. long by 16-in. wide by 12-in. high and the 3-way blocks are 3-ft. long by 16-in. wide by 6-in. high, the diameter of the hole being $3\frac{1}{4}$-in. for both sizes, this being sufficiently large to take a 900 pair No. 22 B. & S. gauge lead covered cable.

In the manufacture of the concrete ducts, suitable wooden forms with steel end plates and a steel mandril were used. The steel end plates were found necessary to produce a flat end surface, thus assuring the matching of blocks during laying. The steel mandrils used were removed from the block after the initial set and the holes flushed with a neat cement mixture. The mandril was then restored and rotated. In this fashion, the inside of the duct was made very smooth. To obtain this smooth surface, however, the steel mandrels had to be carefully cleaned and polished after each operation.

The underground duct system was laid almost entirely under the sidewalks. All ducts were laid on a concrete base 3-in. thick and at a depth to give a uniform coverage of 18-in. The duct blocks were fitted together by dowel pins and the joints covered with a strip of cloth 5-in. wide saturated with cement over which was placed a collar of concrete 2-in. thick and 5-in. wide. A 7-ft. mandrel was used in lining up sections as laid and after the completion of a section between man holes, mandrels were drawn through to assure proper alignment of the complete job. In crossing streets, the duct was completely boxed in with 4-in. concrete slabs. The majority of the man holes were 5-ft. by 5-ft. in area with a concrete bottom and brick walls and with a reinforced concrete top. Double cast iron covers with locks were provided for all man holes.

A total of 600 reinforced concrete poles manufactured locally were used on the project, a majority of which were 40-ft. long. The poles were set to a depth of 5-feet on a concrete base. Poles located at street corners or other points where they would be subject to damage from vehicles, were protected by a concrete collar up to a height of three feet above the ground.

It is not extravagant to say that the automatic service has more than lived up to the fondest expectations of the people of Canton. The success of the installation and speed in which the equipment was installed was due largely to the close co-operation and assistance rendered the China Electric Company by Mayor Lam Wan Koy and other municipal officials.

Canton Broadcasting Station

THE Municipality of Canton has recently installed a radio broadcasting station in Central Park. Recognizing the importance of the transmitting station in producing broadcast programmes, the authorities after careful consideration, decided to instal Western Electric equipment which has attained an enviable reputation for reliability for quality of transmission. Consequently, an order was placed with the China Electric Company for a 1,000 watt station including two 140 feet Milliken ground towers, antenna and ground systems. The station is equipped with a new type of transmitter, embodying the accumulated experience of the past few years.

The new transmitter has been made possible by a recent achievement, the development of a water proof tube capable of delivering several kilowatts, the plate voltage of the tube being

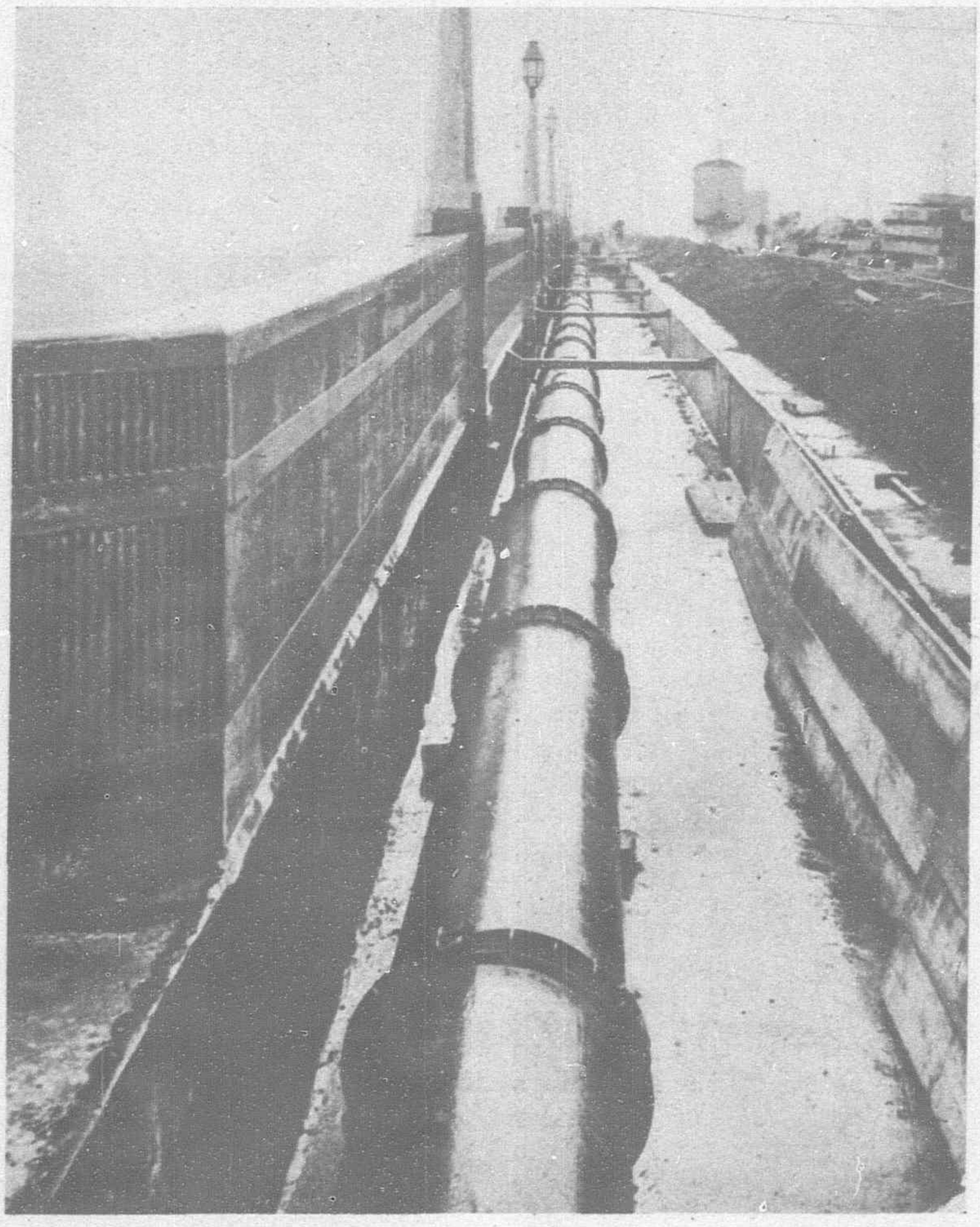
(Continued on page 472).

Modern Flexible Pipe Joints

An Important Installation for Tokyo Gas Works

UNDOUBTEDLY one of the most interesting engineering inventions of modern times is the "Victaulic" flexible pipe joint, the invention of the late Lieutenant E. Tribe, with the final collaboration of Dr. Hele-Shaw, Past President of the Institution of Mechanical Engineers. One of the most important fields is towns gas mains, and in this connection the Tokyo Gas Company have just ordered for the complete reconstruction, now being carried out since the earthquake, 16,980 "Victaulic" Flexible Joints of 6-in.—30-in. size, for 40 miles of high pressure gas mains. Further, it may be stated this extensive order follows upon a previous delivery in 1928 of 2,000 joints of 24-in. and 30-in. sizes, while previously exhaustive tests had been undertaken with a trial lot of smaller joints.

We are able to reproduce several photographs showing recent applications in the towns gas industry in Great Britain. The first of these shows two 20-in. gas mains being laid over the bridge at Newport (Mon.), the neat appearance of the completed joint being well shown, while the second photograph represents a 24-in. gas pipe main belonging to the Gas Light & Coke Company being laid over the bridge at Barking.



Victaulic Joint 24-in. Gas Pipe Line, Gas Light & Coke Co., Barking, London

Of great interest also to general conditions in the Far East is the application to mining, and in this connection a characteristic example of the value of the joint for compressed air mains is given in a recent number of the Proceedings of the South Wales Institute of Engineers, in a paper entitled "A Centralization Scheme for the Gyfeillon Group of Pits," which belong to the Great Western Colliery Co., Ltd. (South Wales).

In this case the compressed air is delivered to two horizontal receivers 30-ft. by 8-ft. situated near the compressors, and conveyed from these receivers in 16-in. diameter mains for a short distance, being then coupled up with "Y" pieces in the first place to the old 12-in. range which goes to the "Hetty" pit top, and subsequently to a 10-in. range which goes down the shaft. The other leg is coupled up to a new 12-in. range connecting to the No. 1 pit through a culvert, and then down No. 1 shaft.

The whole of these new air mains are of steel, and "Victaulic" flexible joints are

(Continued on page 472.)

Victaulic Joint two 20-in. Towns Gas Mains. Newport, Monmouthshire

Victaulic Joint 24-in. Gas Pipe Line, Gas Light & Coke Co., Barking, London

Shanghai's Largest and Most Modern Flour Mill

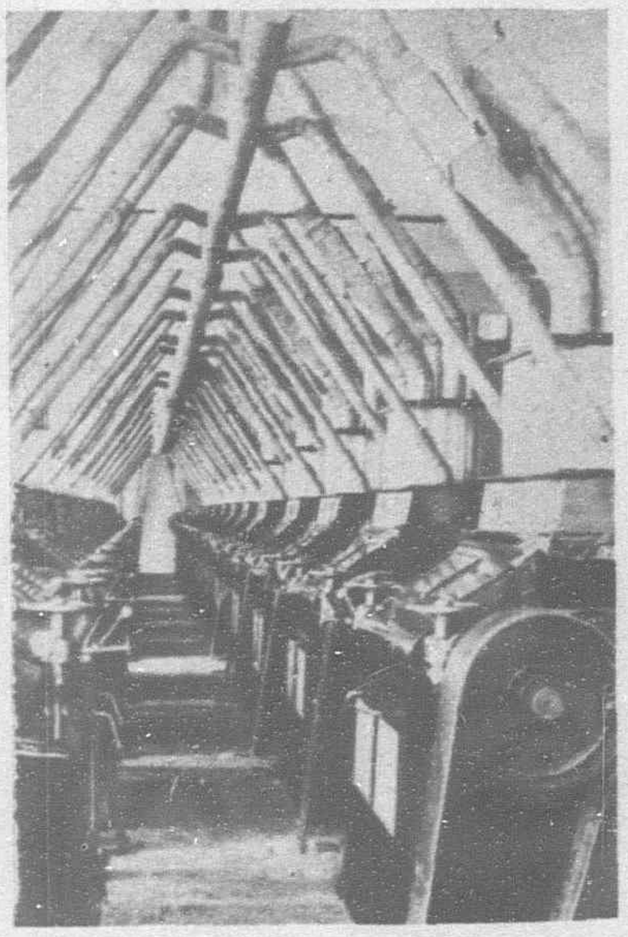
IN 1898 the present Fou Foong Flour Mill Co., started their business as Flour Manufacturers with a small mill, making 1,600 bags of flour (each 50 lbs.) per day of 24 hours. To-day they are the proud possessors of the finest Flour Mill east of Suez.

This mill which was recently opened for operation, when completed, will also be the largest mill in the East having a massed production of approximately 25,000 bags of flour per day.

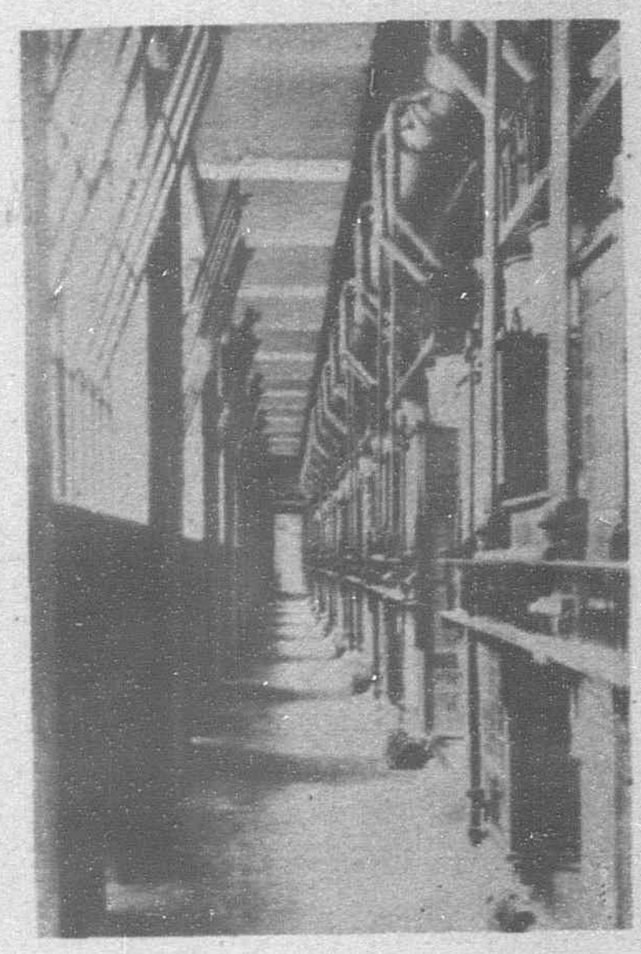
The present and first unit which is producing over 8,000 bags of flour per day was supplied by Messrs. Henry Simon, Ltd. of Manchester, one of Great Britain's oldest established firms of flour mill machinery manufacturers, and the leading mill furnishers in Europe. The China interest of Messrs. Henry Simon, Ltd., is looked after by Mr. G. H. Akerman, their resident milling engineer and representative. The China Agents are Messrs. Arnhold & Co., Ltd.

The machinery was installed by Mr. F. C. Farmer, Superintendent of the Fou Foong Flour Mill Co., together with Mr. T. H. Gillett, milling engineer of Henry Simon, Ltd.

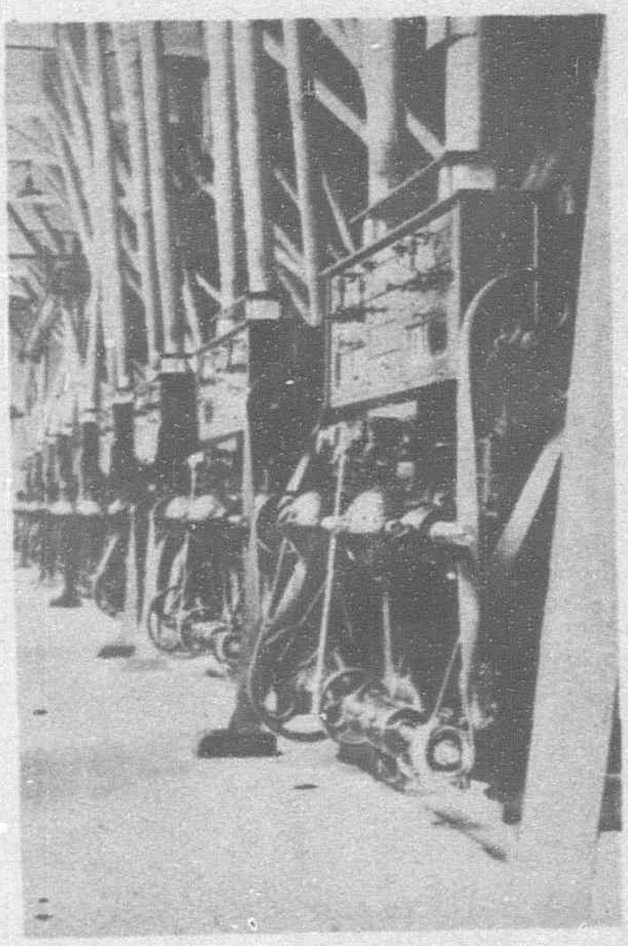
It is not a well known fact that the first flour mill ever built in Shanghai was supplied by Messrs. Henry Simon, Ltd. This mill was known as the China Flour Mills, erected in 1896. Messrs. Henry Simon also bid for the installation of the first Fou Foong Mill but could not then compete against the American manufacturers, but to-day not only can they compete in price quotation but can install far more substantial machinery at a very reasonable price as is shown by the Fou Foong order for the new mill.



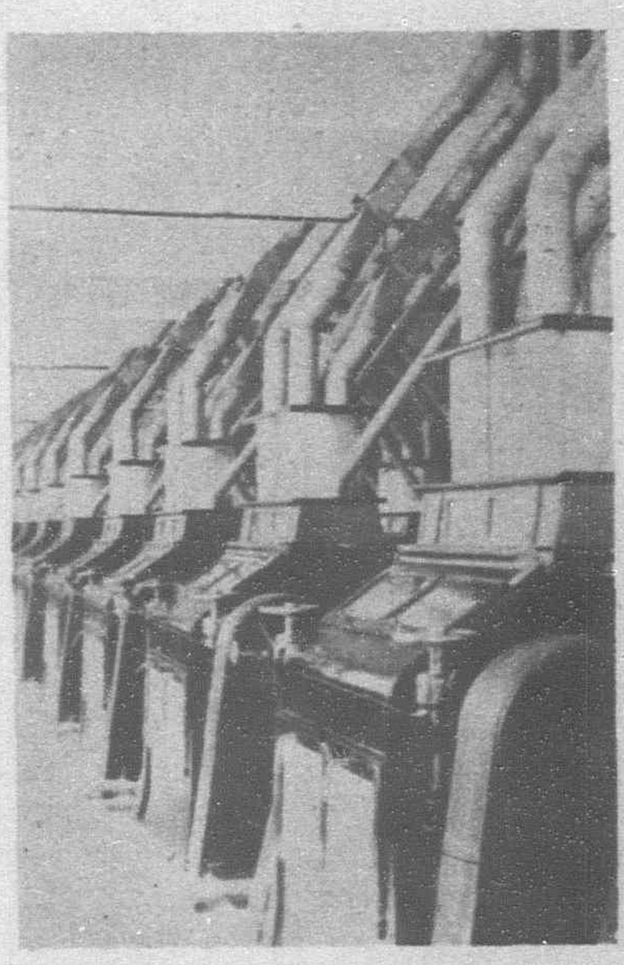
The Roller Mills



The Outside Line of Plansifters



A Line of Purifiers



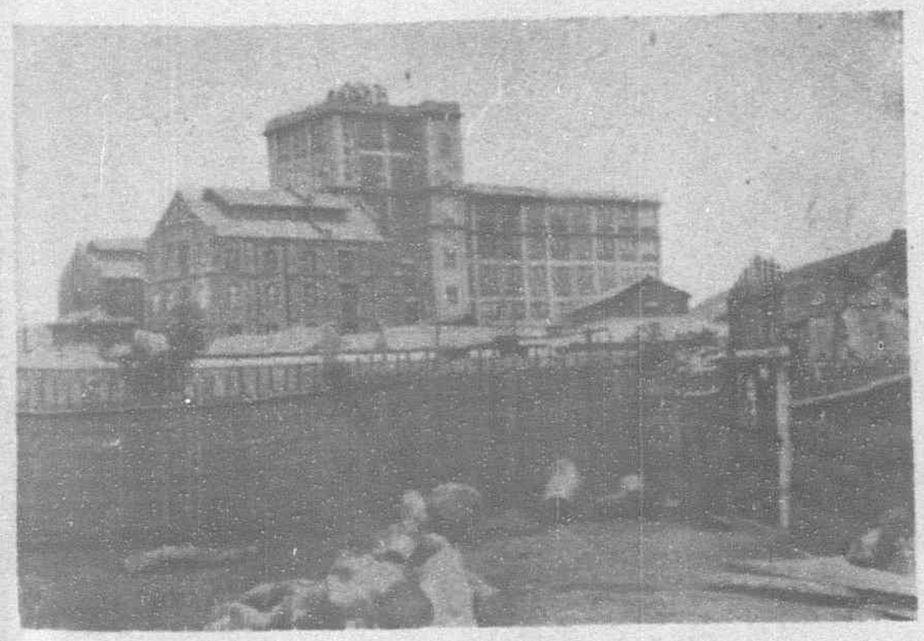
Outside Line of Rolls

Description of the Mill

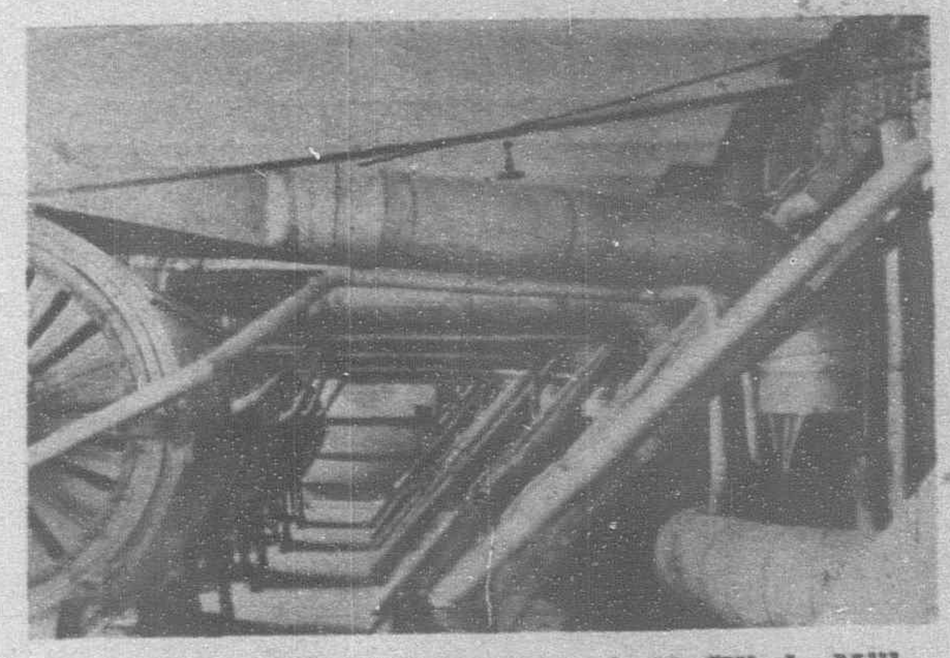
THE POWER PLANT :—The power for driving the mill is taken from two A. E. G. motors, one of 550 H.P. and the other of 250 H.P. The larger motor is used for driving the mill proper and the smaller motor for driving the wheat cleaning plant. Both motors are of the synchronous induction type and are made for a 6,000 volt current which is supplied by the Shanghai Power Co.

Power is transmitted from the 250 H.P. motor to the main shaft of the wheat cleaning department by a 20-in. Heavy Double Leather Belt. This department consists of the well-known Simon wheat cleaning machinery where the wheat gets a thorough cleaning over separators, scourers, cockling machines and brush machines. In this department there is also installed a washing plant for the treatment of very dirty wheat and for the extraction of stones. After cleaning, the wheat is kept in storage bins or silos. These silos are large enough to contain enough wheat for 48 hours working of the mill and run six out of the eight floors of the cleaning department.

The mill proper is driven by the 550 H.P. motor and is direct connected to the main shaft which runs the whole length of the ground floor of the mill and drives the 24 stands of roller mills, situated on the floor above, the ground floor is taken up with main shafts, elevator boots and all the packing off of the different grades of flour is done here. There are also conveyors with the "Simon" Exact Measurers, underneath the Silos from which the wheat is measured and taken on to the mill by conveyors for grinding. On the first floor are the 24 Stanch of the "Simon" four roller mills, each machine having two pairs of rolls 40-in. long by 10-in. diameter, 10 of these machines contain fluted rolls for the grinding of the wheat and the extraction of the bran, the remainder are smooth



The Old and the New Mills



Exhaust and Dust Collectors of the Whole Mill

rolls and are used for the gradual reduction of the Simolina and middling into flour. The special features of these roller mills are their patent feed device which keeps a constant even stream of stock going to the rolls for reducing ; and their patent micrometer roll adjustment, whereby the solid 40-in. by 10-in. chilled iron can be minutely adjusted and thereby getting even grinding the whole length of the rolls by simply turning a small thumb screw (the bearings carrying these rolls are made of special phosphorus bronze which allows of no vibration to the rolls and at the same time lasts a lifetime.) The machine as a whole is the last thing inroller mill perfection. When completed the mill will have 65 of these roller machines. The second floor is the spouting floor where spouting is done by the machines placed above the roller mills. There is also a number of conveyors and the bran duster are also situated on this floor.

On the third floor there are nine "Simon's" Double Purifiers and eleven Simon's Centrifugal flour dressing machines. This type of purifier are the first to be installed in China, they grade and purify the different Simolina and middlings before their being sent to the roller mills to be ground for the flour dressing machines. The excellent work of these machines enables the mill to make from eight to 10 per cent. more High Grade flour than any former mill erected in Shanghai. The purification process on these machines is done by air currents and trays which catch all impurities and tail these off to the Low grade portion of the mill. All silk sieves and trays on this machine are kept clear by automatic brushers ; all settling chambers are also automatically kept clean by continuous cleaners. The Centrifugal dressing machines for dressing out the lower grade flours are of the usual " Simon " substantial built machines and are all clothed with silk covers.

The next floor, the fourth floor, is the sifter floor. Here are 16 Simon Free Swinging Plansifter which do all the dressing out of flour and grading of simolina and middlings. These machines take all the ground stock from the rollermiller and break it over a nest of sieves making the different separations and extracting the high grade flour. A special feature of these machines is the very small power required to drive them, requiring only about 8 H.P. to operate the whole 16 machines.

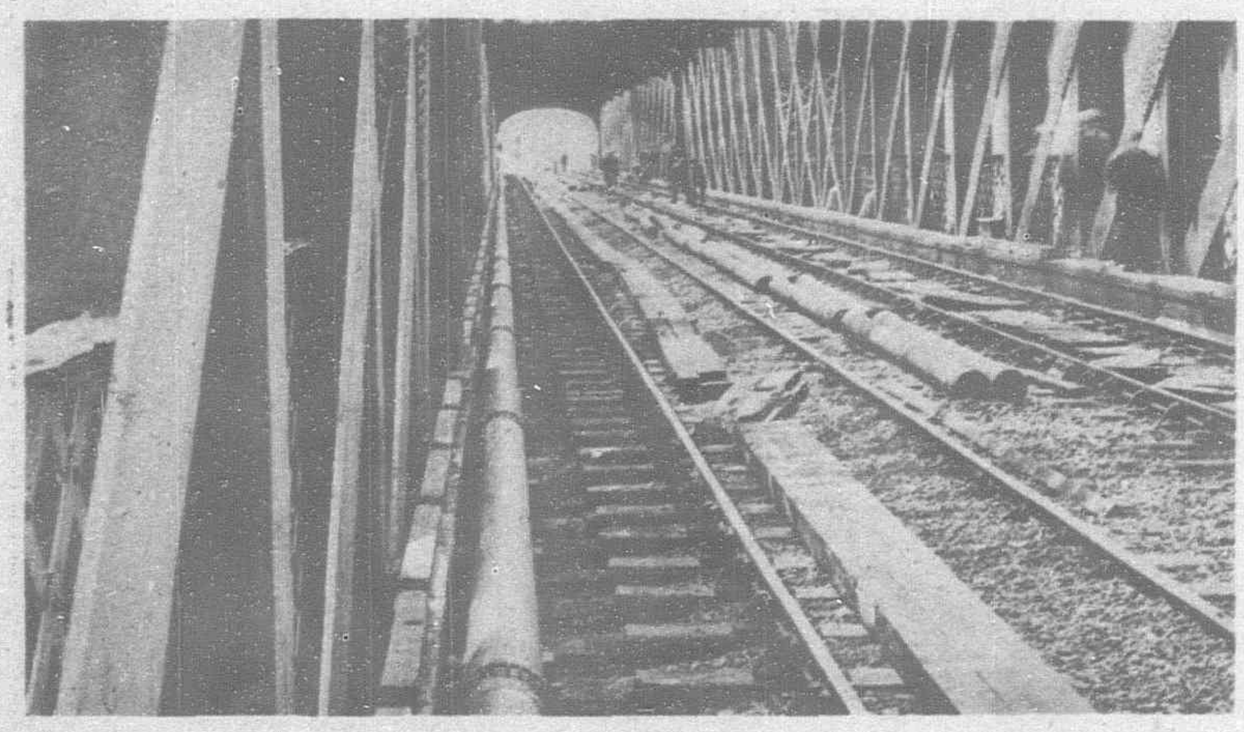
(*Continued on page 476*).

Modern Flexible Pipe Joints

(*Continued from page 470*).

equipped throughout, which is believed to be the first case in min ing where this type of joint has been used on such a large size vertical main in the pit shaft. The pipes are glanded to steel byatts at 27-in. center distances, and the intermediate joints between these byatts allow for expansion and contraction, so that there is no need to fit expansion pipes. It appears that this special range has been in use for nearly three years, and not the slightest trouble has been experienced, nor has any joint had to be repaired.

The joint is of course a British production throughout, controlled by the Victaulic Co., Ltd, Kings buildings, Millbank, Westminster, London, S.W.1., and has the great advantages of being fitted almost in a few minutes without skilled labor, and at the same time giving an absolutely dead-tight joint under all conditions, operating almost from complete vacuum to 4,000 lbs. per square inch. Further, the joint possesses the remarkable faculty of being flexible in the sense that there is no need for dead straight alignment of the pipe line as indicated, which for example, can be laid for miles on the roughest surface above or below ground, almost like a cable, particularly valuable of course for compressed air mains, as well as towns gas, natural gas, crude oil, and salt water for example, another of the main applications being in the oil fields.



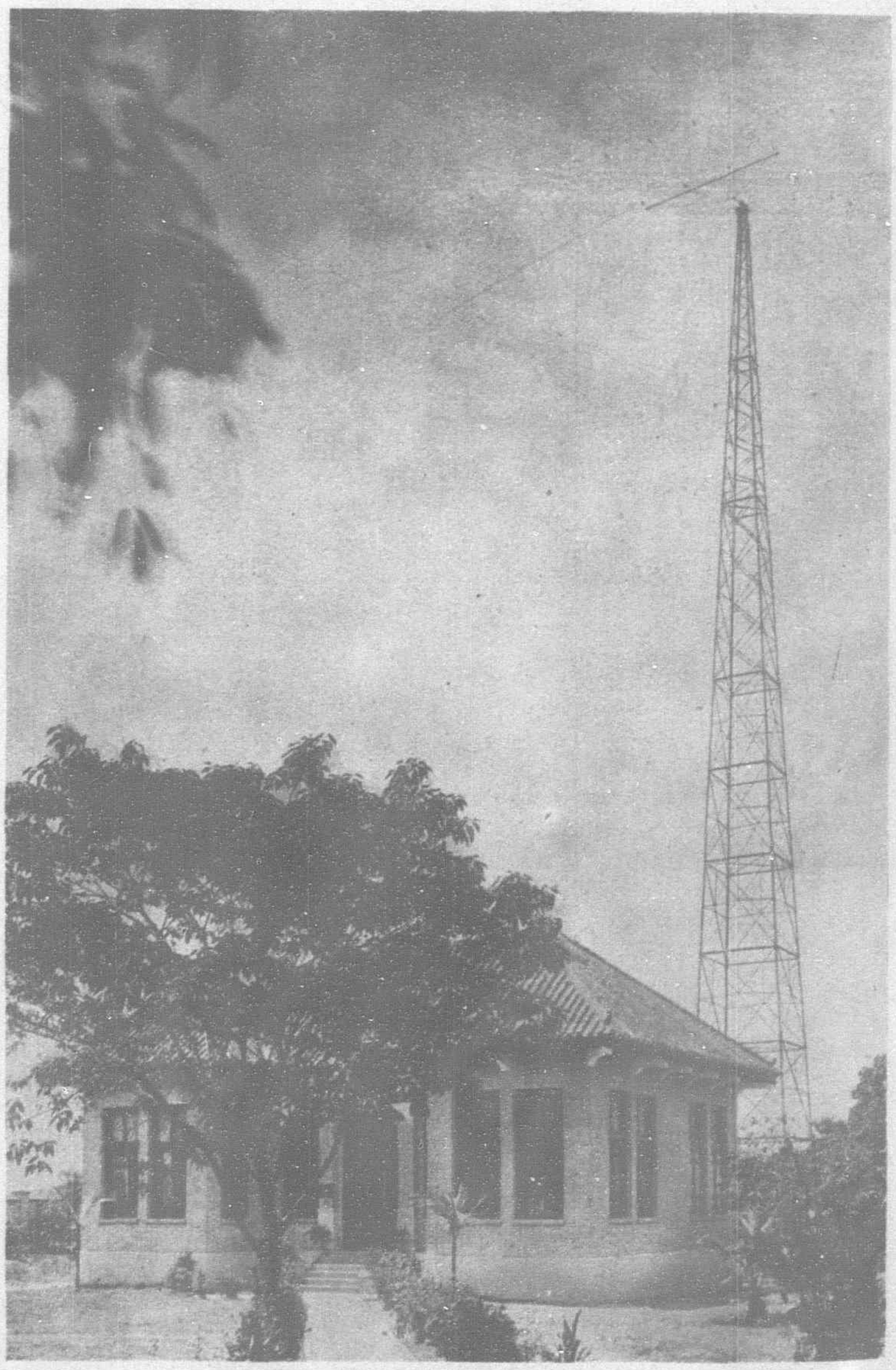
Victaulic Joint Water Pipe Line Over the Tay Bridge, Dundee

Canton Broadcasting Station

(*Continued from page 469*).

only 4,000 volts. Using a large single tube to replace a number of smaller units is especially important from the stand-point of economy and affords numerous other advantages.

The rated output of the Canton station is 1,000 watts. This represents the power delivered to the antenna when the microphone is disconnected. During modulation the instantaneous antenna power rises and falls from this value in accordance with the speech or music to be transmitted, the peak at times representing as much as 2,500 watts. Ample tube capacity enables these conditions to be met without distortion. The equipment is installed in the new building in Central Park in which is also located a sound proof studio. The antenna which is of a four wire "L" design, is carried on two Milliken towers 140 feet high and 240 feet apart. The towers are fitted with winches so that the antenna can be lowered for inspection or repair. The station is operating at present on a wave length of 731 kilocycles (400 meters) and programmes have been heard as far away as Shanghai and Hankow.



Canton Broadcasting Station, Installed by China Electric Company

New Waterworks Plant for Canton

Latest Scientific Principles for the Far East

(SPECIALLY CONTRIBUTED)

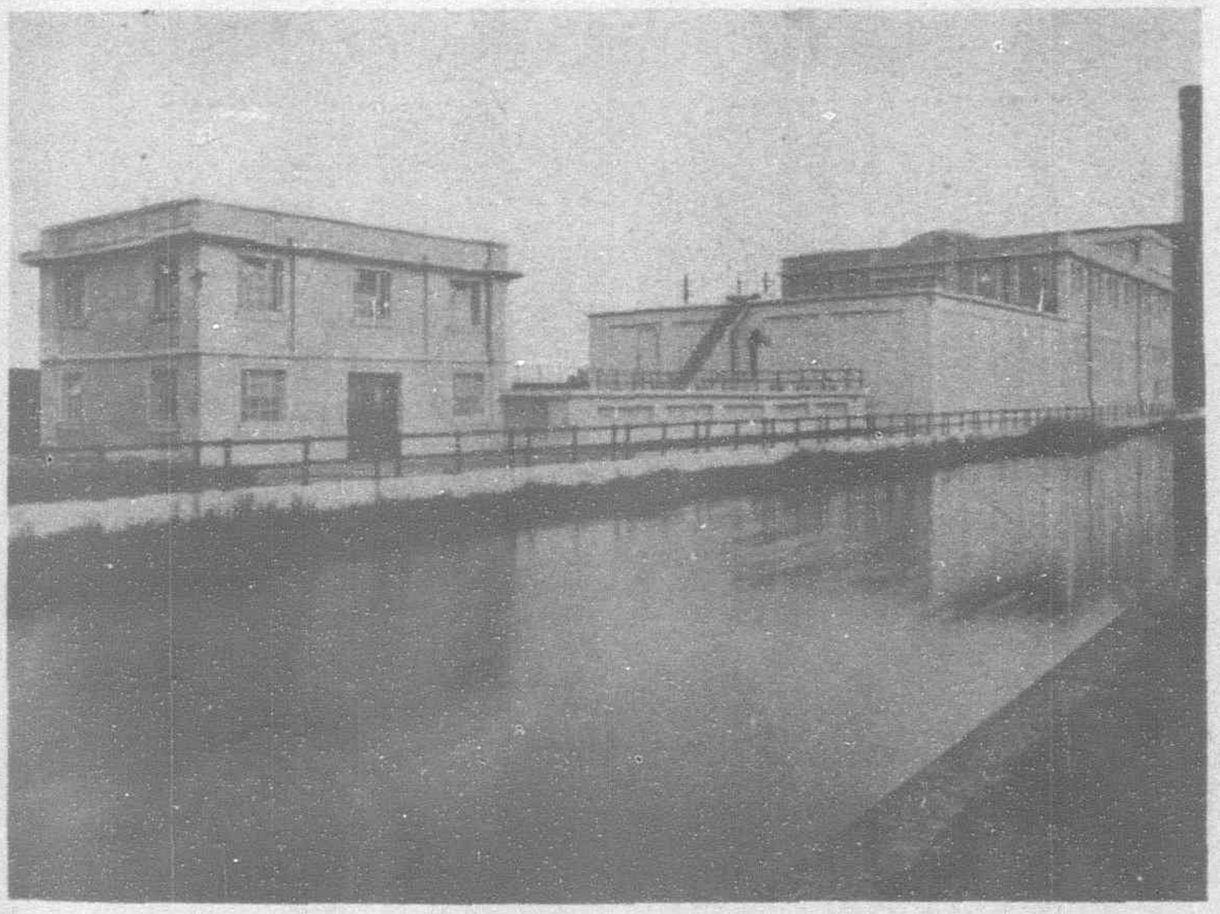
MODERN methods of towns water purification are a striking example of the co-operation of the chemist and the engineer, and the fact that China is now waking up very effectively is well illustrated by a contract that has been signed by Dr. Wu Pak-Liang, Commissioner of the Canton Municipal Waterworks, and the Mayor of Canton, Mr. Lam Wan-koi, with the Jardine Engineering Corporation, Ltd, of Hong Kong. This is for the installation of a "Paterson" patent rapid filtration plant at Canton to deal with 10,000,000 gallons of water per 24 hours, on the latest scientific principles of sterilization and continuous treatment.

The raw water will be taken from the Canton River at Tsang Poo, about six miles from the City of Canton, and pumped to the "Paterson" patent rapid sand filters, the installation in this connection consisting of three electrically driven low-lift pumps, each with a capacity of 5,000,000 gallons of water per 24 hours, one being a stand-by. There will be a battery of 16 of these sand filters, operated in conjunction with the "Chloronome" apparatus for the complete sterilization of the water by means of a measured trace of chlorine gas, and the whole installation is on the same general lines for example as the Shing Mun Valley Scheme for the Hong Kong Corporation. There is also included, coagulent treatment by means of alumina, with four very large sedimentation tanks, having a total capacity of 1,200,000 gallons, allowing three hours' settling before passing to the sand filters. The total cost of the whole equipment, including the pumps, pipes and other accessories, is we understand, approximately 2¼ lakhs of Hong Kong dollars.

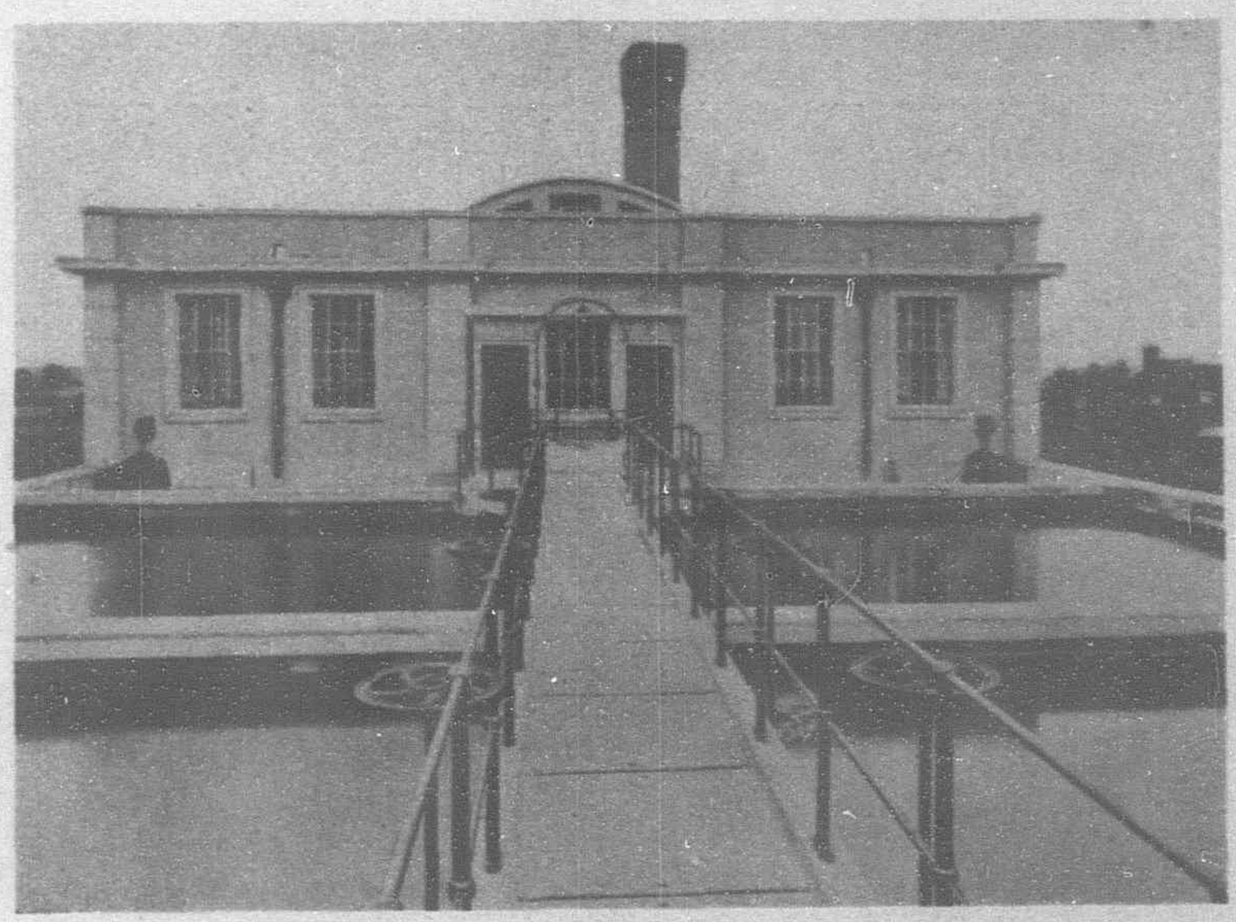
This scheme was originally proposed by Mr. R. Chan Johnson, the late Managing Director of the Canton Water Supply Co., Ltd., which was subsequently taken over by the Municipality of Canton, in which connection the commissioner, Dr. Wu Pak-Liang and his associates made a complete inspection of the "Paterson" plants both at the Shing Mun Valley and the Bowen Road Scheme, Hong Kong. When the installation is completed the important City of Canton will have a water supply equal in efficiency to that of the largest cities in Europe and the United States, while it may be mentioned that Canton is making progress in many other directions, including for example the introduction of a complete automatic telephone system.

The general method adopted in these schemes, of which a large number are at work in India and the Far East, with suitable variations according to the local circumstances, is to treat the raw water with lime and alumina coagulents, pass to settling tanks, and then to filter through rapid gravity sand filters constructed of ferro-concrete and filled with graded sands, through which the water circulates generally at the rate of 80 gallons per square foot of filtering surface per hour, being collected at the bottom by a large number of gunmetal nozzles. The clear water is then treated by the "Chloronome" apparatus which as a rule adds continuously about one part of chlorine gas to 2,000,000 gallons of water, although the exact amount is varied, giving complete sterilization without any trace of taste or smell. A large proportion of London water for example is being treated on these lines, the normal consumption averaging about 250,000,000—300,000,000 gallons per day in Greater London with 8,000,000 inhabitants.

(For photographs of a similar plant in England, see next page).



Elevation to Canal with Press House in Foreground



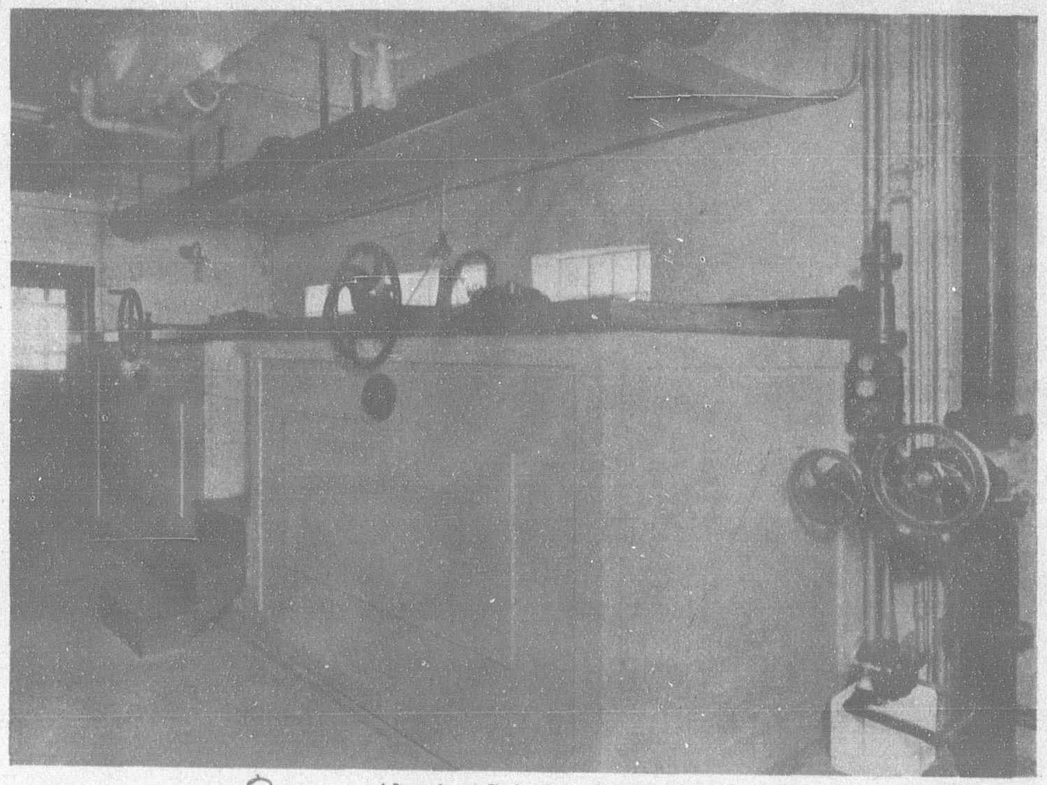
Precipitation Tanks and Filter House

Progress in Wusih

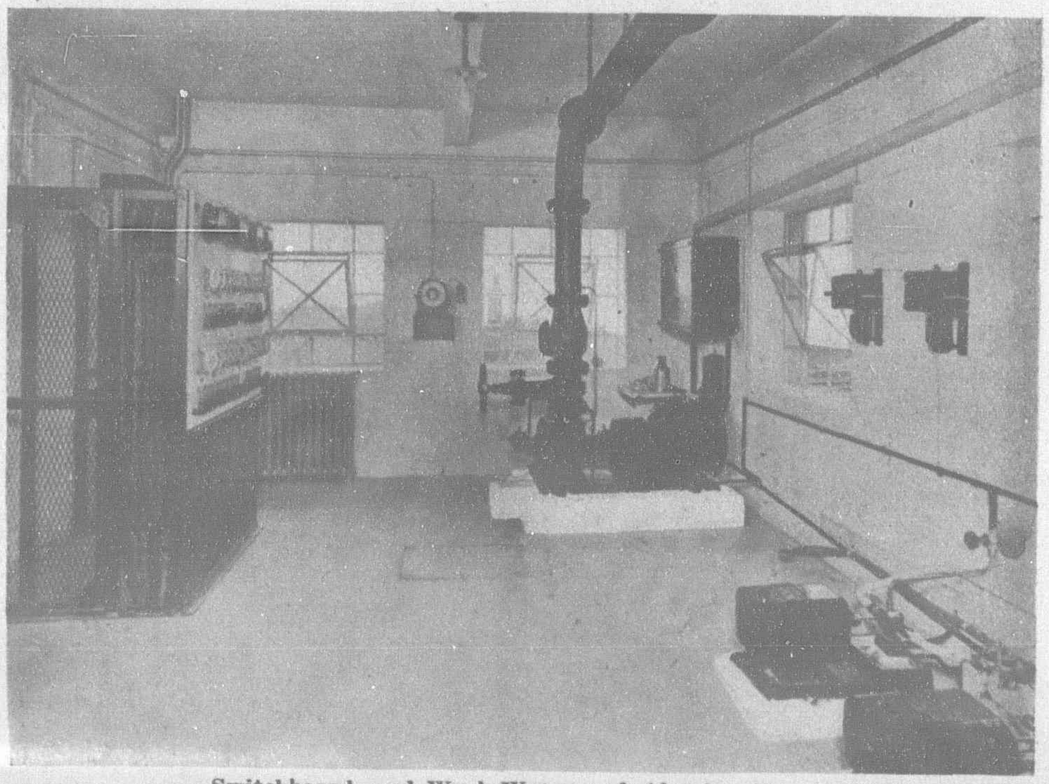
Whether it is the result of the progress made in the mechanization of the silk filatures or not we do not know, but Wusih is demonstrating a remarkable aptitude in the application of power to its various daily needs, particularly along industrial lines. Water-wheels are becoming things of the past, and a correspondent writes that practically all the irrigation of the paddy fields is now done by power pumps driven by internal combustion engines, which, being installed on boats, can be moved from place to place as the exigences of the situation would seem to dictate. Here again not the least interesting thing to notice is the Chinese adaptability in such matters, for by putting the outflow pipe of the pump overboard and thereby discharging a stream of water of about half a foot in diameter sufficient force is obtained to drive the boats along at about three miles an hour. The canals around the city are now being kept in good condition and always deep enough by a mechanical dredge, power driven, which has recently been put into use. And the fire brigade is now equipped with a motor driven pump, which has become necessary owing to the height of the new buildings with which the brigade's earlier appliances could not hope to cope.

PATERSON PATENT RAPID FILTRATION PLANT TO BE INSTALLED AT CANTON

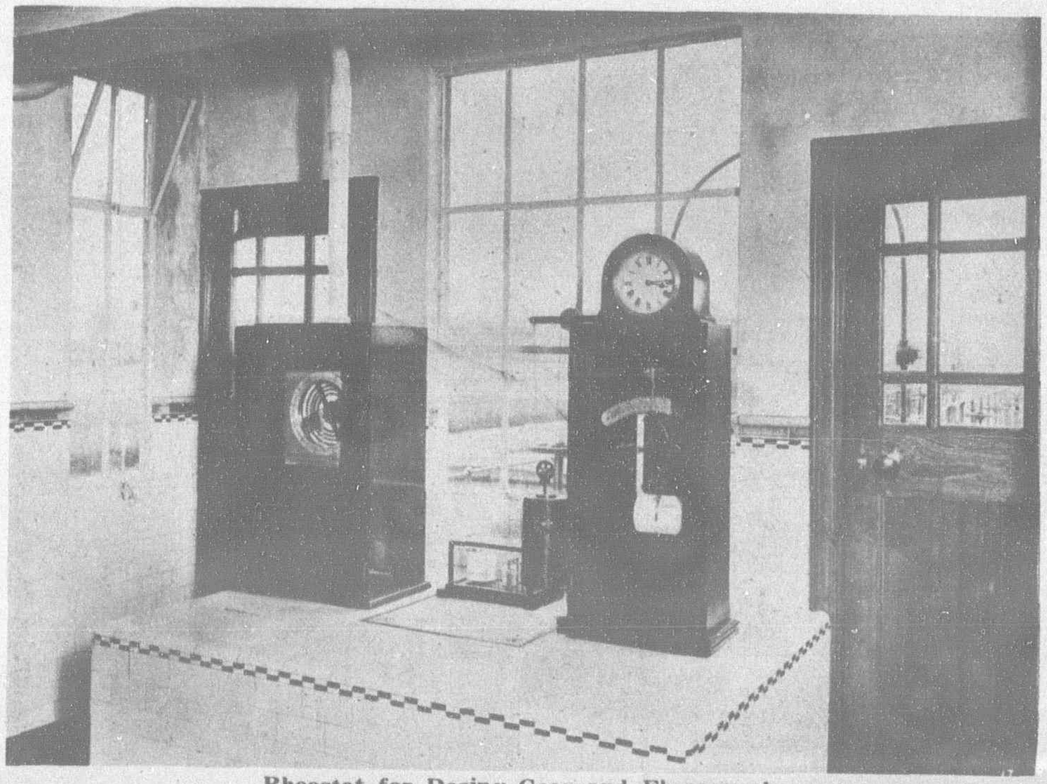
1 Working Platform and Central Gangway in Filter House



2 Alumina Solution Tanks



Switchboard, and Wash-Water and Alumina Pumps



Rheostat for Dosing Gear and Fluxograph

A Cotton Mill Electrification Scheme

New Generating Plant and Motor Drives at the Ahmedabad Advance Mill

AN interesting example of the modernization of power plant for textile mills is an installation of generating equipment and electric motor drives recently put into commission at the Ahmedabad Advance Mills, India.

Prior to this installation the power for operating the mill was supplied mainly by a reciprocating steam engine, the drive being transmitted by means of a rope pulley system to the line shafting in the different rooms. The power from the steam engine was supplemented by a supply of electricity from a diesel-engine generating set, this supply being used to operate part of the mill equipment, pumps and other auxiliaries outside the area covered by the rope drive and line shafting system.

It was decided by the mill authorities to do away with the old driving plant described above and put in its place a modern electrical power plant. The scheme adopted involved the construction and equipment of a new power house and a new boiler house, with provision for all necessary services, including a new large cooling tank for the circulating water system. The change also necessitated the installation of a number of electric motors of suitable power for group drive of the mill machinery.

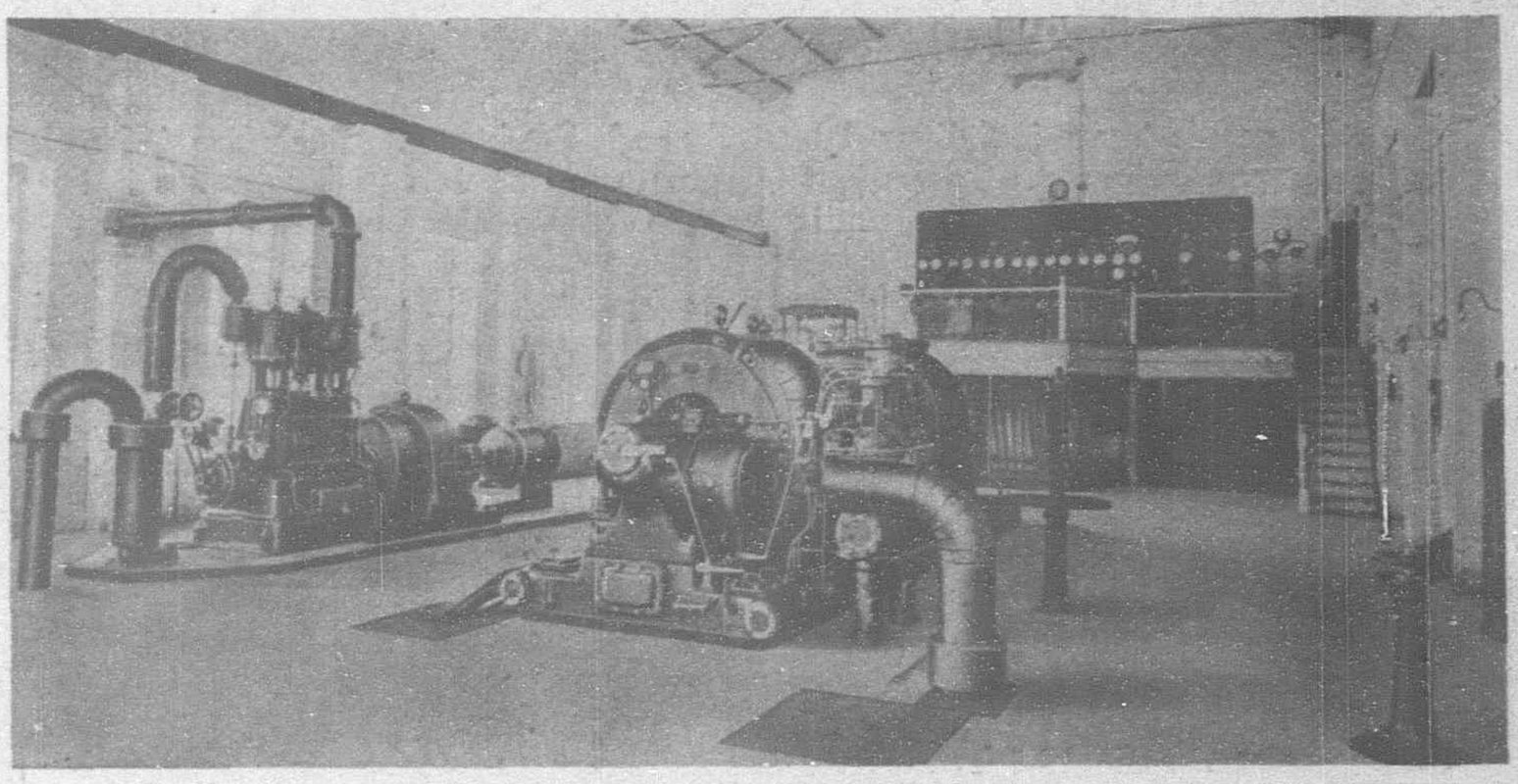


Fig. 1.—General View of the Power House Interior

The initial equipment of the new power house includes as its main items a 1,700 kw. turbo-alternator set with jet condenser, a 112 kw. steam engine pilot generating set and a 9-panel switchboard. The main contract for this equipment together with the motors for the mill drive and the power house auxiliaries, was carried out by the Metropolitan-Vickers Electrical Company as main contractors, the steam engine for the pilot sat being supplied by Messrs. Browett, Lindley & Co., Ltd. on a sub-contract. The contract for the boiler plant was carried out by Messrs. Daniel Adamson & Co., Ltd. The construction of the new cooling tank and a new injection well, as also the erection of the new equipment was carried out by the Ahmedabad Advance Mills, Ltd. The arrangements for the British contracts were made on behalf of Ahmedabad Advance Mills, Ltd. by the London Office of Messrs. Tata, Ltd.

Fig. 1 gives a general view of the interior of the new power house and shows the equipment installed. The building which is 80 feet long and 40 feet wide, is constructed with a main floor for the generating plant, a basement for the condensing and auxiliary equipment and a gallery for the switchgear.

The turbo-alternator set consists of a steam turbine of 1,700 kw. maximum continuous rating driving at 3,000 r.p.m. a generator of similar capacity. The turbine operates with steam at a pressure of 200 lb. per sq. in. at the turbine stop-valve and 200° F. superheat. At full load exhaust steam the vacuum is 27 inches, obtained by means of a Metrovick multiple-jet type condenser. The alternator gives its output at 525/550 volts, 3-phase, 50 cycles and 0.8 power factor. It is ventilated on the Metropolitan-Vickers closed circuit system in which a limited quantity of air free from dust and moisture, is circulated continously through a closed circuit consisting of the ventilation passages in the machine and a chamber within the foundations. The system includes an air-cooler and an alarm device which gives warning if the air temperature should become excessive, in which case dampers operated by a hand-wheel are used to give open air circulation until normal conditions are restored.

Fig. 2 gives a view of the turbine basement and shows especially the condensing plant. As already stated, the condenser is of the multiple-jet type, in which injected water is mixed with the steam to be condensed, the cooling water and condensed steam being removed by a rotary extraction pump and the air and incondensible gases by a rotary valveless dry-air pump. This type of condensing plant has the excellent features of simplicity, small floor space requirements, high and practically constant efficiency and long life with small maintenance cost. The equipment of this set is capable of dealing with 23,000 lb. of steam per hour when supplied with 2,600 gallons per hour of water at a temperature of 95°F. The pumps of the condenser equipment are driven by a 107 hp. Metrovick motor.

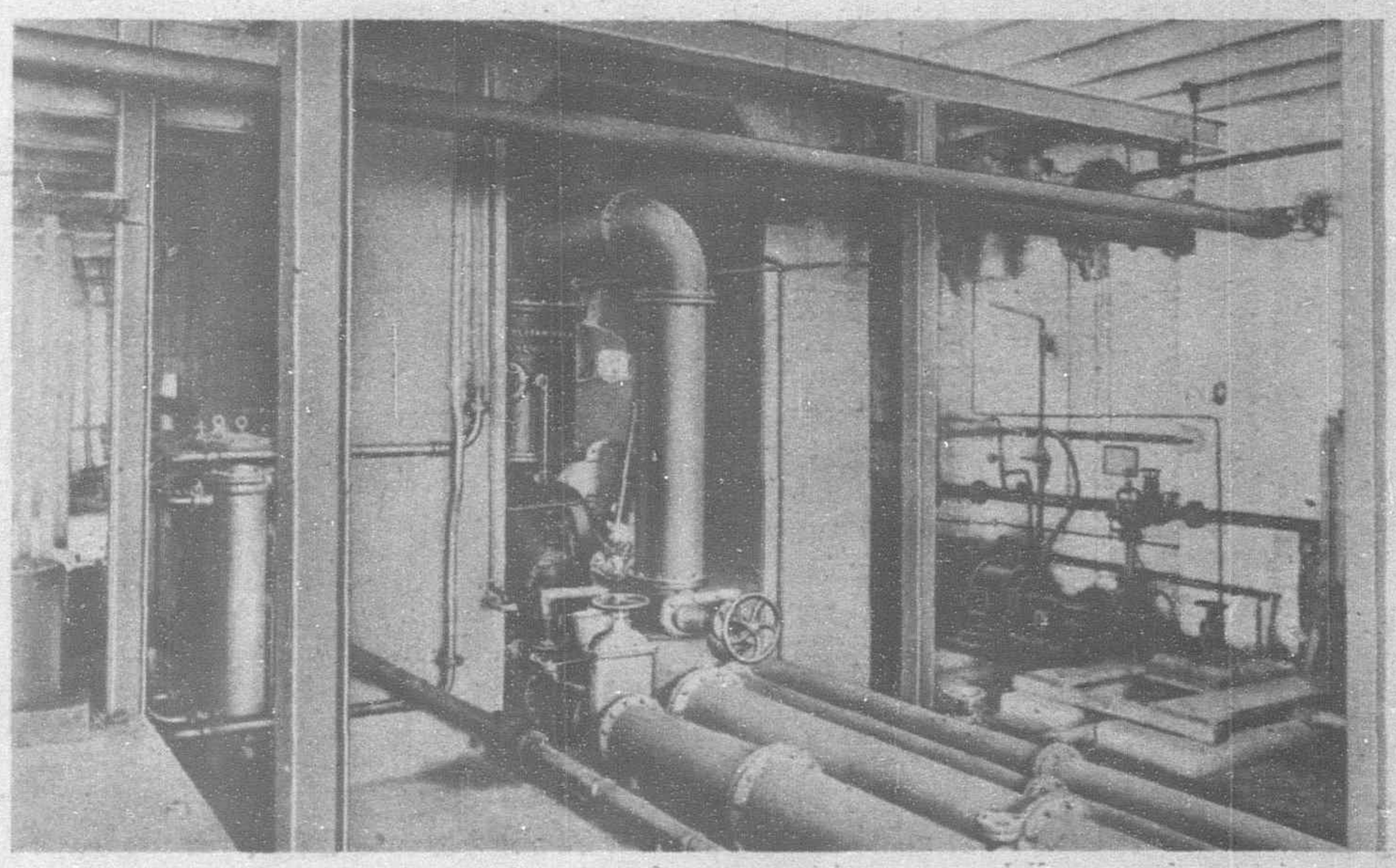


Fig. 2.—The Turbine Basement

The cooling water and the boiler feed water are drawn from an injection well 12 feet in diameter and 21 feet deep which has been constructed just outside the power-house. The well is fed from a large cooling tank, also newly constructed, about 800 feet away. Fig. 3 gives a view of the tank, which is about 300 feet long and from 100 to 220 feet in width and has a capacity of 5,000,000 gallons. The supply to the well is by natural flow through a masonry tunnel 3 feet

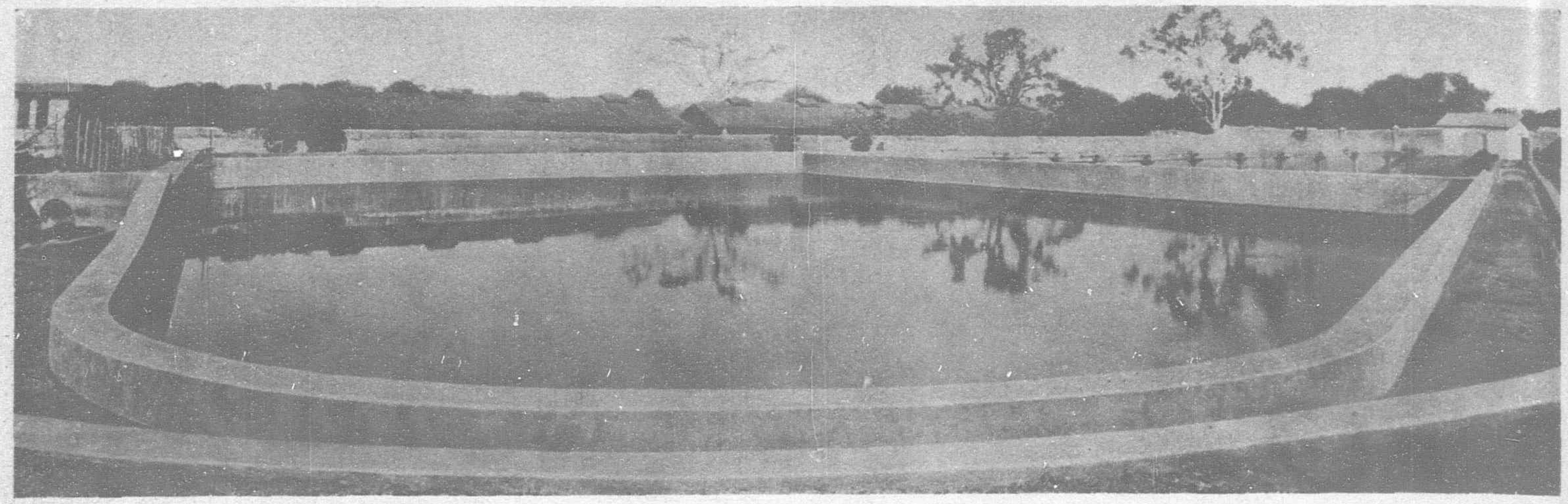


Fig. 3.—The Cooling Tank

by 2 feet in section, while the condenser discharge is delivered by a 16 inch pipe line to cooling sprays over the pond. In order to make up the losses due to evaporation a supply of water amounting to 1,400 gallons per hour is fed into the system, this make up water being treated by a softening plaut to remove dissolved matter which would otherwise be liable to produce scale in the boilers.

The pilot set is required mainly in starting up, its duty then being to run the auxiliaries and to excite the turbo-alternator field until the main set is up to speed.

It also provides a convenient source of power for maintenance or other work, and for lighting, when the turbo-generator set is shut down. The engine is of the two crank, compound vertical, double-acting type, capable of developing 130/165 B.Hp. at a speed of 500 r.p.m. with steam at 195 lb. per sq. in. pressure at the stop valve and exhausting to atmosphere. The alternator, which is direct coupled to the engine, has a capacity of 112.5 kva. corresponding to 90 kw. at 0.8 power factor, and generates at 525 volts, 3-phase, 50 cycles. The exciter has a capacity of 20 kw. adequate for exciting not only the pilot alternator but also the main alternator during the starting period.

The switchgear is mounted on a gallery standing at one end of the power station and seen in the background of Fig. 1. On the front of the gallery are four field rheostat pedestals which control respectively the fields of the two alternator and the two exciters. Extending across the gallery is the main switchboard, a 9-panel arrangement of sheet-steel cubicle type units. Two of the cubicles carry the control and protective gear for the main and pilot alternators, one panel carries summation equipment comprising recording and integrating watt-hour meters, power-factor indicator, frequency meter and other instruments and six panels are for feeders, three of 250 kw. and three of 350 kw. capacity.

The cubicles are fitted with hinged doors at the rear and are provided with a system of interlocks whereby the cubicle doors cannot be opened unless the isolating switches and circuit-breakers have been placed in the open position. The circuit-breakers are of the oil-filled type arranged for hand operation, the switches being mounted in the cubicles with the operating handles projecting through the board. Each circuit-breaker is provided with a loose-handle mechanism which makes it impossible to hold the circuit-breaker closed under heavy overload or short-circuit conditions. Overload protection is provided on each cubicle by two transformer-operated trip coils shunted by time-limit fuses.

A 3 kva. single phase transformer giving a 110 volt supply for lighting purposes is mounted at one end of the gallery and beside it is a single panel marble switchboard controlling the L.T. side of the transformer and the outgoing lighting circuits. Besides this panel is a swing bracket carrying synchronizing equipment for use in paralleling the main and pilot alternators.

In addition to the motors installed for the power station auxiliaries a number of new motors ranging from 6 hp. to 300 hp. have been supplied by the Metropolitan-Vickers Electrical Company for group drive of the mill machinery.

All the motors are of the squirrel-cage pipe-ventilated type and for each motor a switch pillar incorporating an auto-transformer starter is provided for separate control. Normally, however, the motors are left connected and run up to speed with the generating plant each time the mill equipment is started up.

In the operations of starting up the mill the pilot set is started first, the output of its alternator being used to drive the condenser motor, so that vacuum is produced in the condenser. At the same time the main field of the turbo-generator is excited by the pilot exciter. The turbine is then started and as the main alternator has full excitation from the pilot exciter the motors in the different departments run up in step with it. When the turbo-alternator set is up to full speed with its output voltage equal to that of the pilot alternator, the condenser motor is disconnected from the pilot circuit and connected to the main alternator circuit by means of a double-throw triple-pole quick-break switch. Finally the main-exciter is paralleled with the pilot exciter, the latter is disconnected fromt he main alternator and the pilot set is shut down. In stopping the equipment steam is merely shut off from the turbine and the turbo-alternator with the motors allowed to run down, the motor control gear being left in the running position ready for re-starting with the main generating set.

Shanghai's Largest and Most Modern Flour Mill

(Continued from page 472)

On the top floor are placed the fans for the exhaust of the different machines together with a number of automatic dust collectors, the exhausting of the mill has been thoroughly planed with a view of keeping the different socks of meal, etc. cool while undergoing the process of reduction into fine flour. On this floor is also the 30 odd elevator-heads discharging the different stocks brought up from below and distributing to the different machines by metal spouting, for treatment.

A special feature in the new mill is the main drive which has been introduced in Flour Mills in China for the first time. This consists of the Dick's Balata Element Driving Ropes which are quite noiseless and are giving perfect satisfaction. The mill building was constructed under the supervision of the well-known architects of Messrs. Atkinson & Dallas, of Shanghai, and has been constructed with a view of making it absolutely fire proof, the whole structure being made of reinforced concrete. The mill furnishers have also endeavored to make the mill fire-proof by making the whole of the installation spouting, elevator legging and conveyors constructed of sheet metal. It is, therefore, an almost impossibility to destroy this mill by fire.

Messrs. Henry Simon, Ltd have a world wide reputation as flour milling and grain handling engineers. Flour Mills on the famous "Simon system" are to be found in nearly every country in the world and many of the largest granaries both at home and abroad are equipped throughout with Simon machinery. Messrs. Four Foong Flour Mill Co., are to be congratulated on the possession of such a fine mill which has been installed and arranged with such excellent results.

Engineering Notes

ELECTRIC LIGHT, POWER AND TRACTION

HIDA DENTO K.K., Hida Electric Light Co., Ltd.—At the end of August, an application of the Hida Dento K.K. to construct a power station on the Gongenya River of the Jintsu River System in Gifu Prefecture was granted.

The company is now inviting contractors and makers, to bid for construction of this power station.

The capacity of this power station is 1,200 k.w., effective head 620 shaku, water quantity 30 cubit feet; the estimate cost of construction is Y.450,000.

HIROSHIMA DENKI K.K. (Hiroshima Electric Co., Ltd.)—Hiroshima Denki K.K. is inviting estimates for all automatic equipment at the Kawahira Power Station, capacity 2,000 k.w. It is reported that the company will probably use Escher Wyss Turbines.

MILLION VOLT TESTING ROOMS.—The Osaka Porcelain Co. (Osaka Togyo K.K.) have partly completed its super high tension testing room (normal 700 kv and maximum 800 kv). The apparatus consist of three units of 350 kv testing transformers which will be connected in cascade to step up the voltage to 1,050 kv to earth, of which two units were completed in March as the first section of the work.

The Japan Insulator Company (Nippon Gaishi K.K.) are also contemplating the construction of a million volt testing room, the apparatus being manufactured by the Shibaura Engineering Works at present and is expected to be completed this fall.

RAILWAYS

LUNGHAI RAILWAY.—Preparations for commencing the construction of the last section of the Lunghai Railway, connecting Tungkwan with Sianfu are under way, it is learned to-day. The Chief Belgian Engineer of the Line has already proceeded to Tungkwan to supervise the surveying of the territory to be traversed by the extension.—*Kuo Min.*

FIRST SUSPENDED ELECTRIC CAR.—The Japan Suspended Electric Railway Co., who are to construct Japan's first suspended electric railway for a distance of about 1 kilometer between Katase and Enoshima, Kanagawa Prefecture, decided that the company should be capitalized at Y.500,000. Mr. Tatsusawa was elected president. The construction work will be commenced very shortly, and the line will be opened early next year with eight cars including one freight car.

JAPANESE GOVERNMENT RAILWAYS NEW DE LUXE CARS.—According to announcements made in the Japanese press, a number of new railway coaches are now under construction for the use of travelers in Japan. Some of these are expected to be placed in service before the end of this year. As an experiment they are being decorated in purely Japanese style, an innovation which is being watched with considerable interest. Some of these have the walls covered with magnificent Japanese silk brocades after the designs in the Momoyama Palace. These are to give "foreign" travelers an idea of proper Japanese interior decoration. Others are finished in the style of the latest American railway cars. These are for the information and edification of Japanese passengers. All the new cars are to be the latest steel construction.

NEW SINGAPORE RAILWAY.—Plans for a new railway to be constructed on Singapore Island, known as the "deviation scheme" have been approved by the Government of the Federated Malay States, according to a report from Trade Commissioner Don C. Bliss, Singapore. The work, which will extend over a period of approximately 2½ years, will, when completed, afford the city of Singapore 9¼ miles of additional railroad with provision for eventual double tracking; two new passenger stations, overhead bridges, and a terminal at the docks. The scheme has been prepared by the Construction Department of the Federated Malay States Railways, Singapore, which will execute the work partly on contract.

SMOKELESS LOCOMOTIVE—One of the fleet of Diesel locomotives, the first one of its kind in Japan, ordered from Germany by the Railway Office, was successfully tested between Osaka and Takatori, western suburbs of Kobe on the Tokaido line of the Government Railways.

The locomotive weighs 60 tons, develops 600 horsepower and is capable of pulling 12 steel passenger coaches of the kind now operated by the Government Railways. The test, made on an up-grade of .03 per cent. showed that it could easily average 25 miles an hour, with a capacity load.

One distinct feature of this Diesel locomotive is that it emits neither smoke nor soot, so very disagreeable in congested districts. Since no steam has to be generated, the engine carries neither a tender nor a coal bunker, and consequently the engine can go either backward or forward, without necessitating tedious switching.

Like turbo-generators aboard the latest steamers, the motive power of this locomotive is furnished by electricity, generated by the internal combustion engine directly coupled to a dynamo. The fleet of these locomotives are to run on the Kobe harbor line where smoke and soot ejected from steam engines frequently gives rise to considerable complaint from the inhabitants.

THE TUNHUA-LAOTAOKOU RAILWAY.—The Tunhua and Laotaokou in East Manchuria is a liaison between the Kirin-Tunhua Railway and the Tumen Decauville Railway, thus completing another Japanese-operated trunkline in Manchuria besides the South Manchuria Railway and the Antung-Mukden Railway.

The object of this new trunkline is to develop the port of Seishin in North Korea, which will give Japan the fourth outlet to the sea on the mainland of Asia. These outlets are Dairen on the tip of South Manchuria, which controls 80 per cent. of the beans and bean oil trade of Manchuria, Antung, a Chinese city under Japanese influence on the Chinese-Korean border, which caters to the entire lumber trade of the Yalu River, Fusan in South Korea, the leading port in that country, and the proposed port of Seishin, which though situated in Korean territory will monopolize the lumber trade of the Tumen River and the export of Chinese agricultural products in that part of Manchuria. All these four trade ports will soon be connected by a huge Japanese railway system, when the 105 kilometers of rail between Tunhua and Laotaokou is laid. This huge railway system of Japan includes the South Manchuria Railway, measuring 902 kilometers, which runs from Dairen to Changchun, the Antung-Mukden Railway of 263 kilometers in length, Korean Railways, measuring 1,750 kilometers in all, consisting of four railways radiating from Seoul, and the contemplated Kirin-Seishin trunkline, consisting of 170 kilometers of the Kirin-Changchun Line, 210 kilometers of the Kirin-Tunhua Line, 105 kilometers of break distance between Tunhua and Laotaokou, 101 kilometers of the Tienpaoshan-Tumen Light Decauville Railway, 43 kilometers of the Tumen Line, and 94 kilometers of the Kwainei-Seishin Line. As soon as the break between Tunhua and Laotaokou is bridged by a standard gauge railway, the Tumen-Decauville Railway will be so standardized, that through traffic can be maintained between Seishin and Kirin.

RAILWAY PLANS FOR CENTRAL SUMATRA.—For central Sumatra a longitudinal network has been designed, in which Pranap, and later Taloek, will be connected as navigable terminals of the Indragiri River, with Moeara Boengo, the navigable terminus of the Batang Hari (Djambi River), while a branch line from Rantau Ilir should serve to connect the fertile centers of Moeara Laboeh and Korintji. As a connecting port in Indragiri, the choice lies between Koeala Tjenako, Pengalian, or the ocean port of Tembilahan. Further to the north the longitudinal line later will need to connect Taloek, Bankinang, and Pasirpengarajan with the port of Pakanbaroe on the Siak River.

For the proper development of central Sumatra, it is necessary to redeem the most fertile and, at the same time, the most isolated districts of Moeara Boengo, Batang Hari (Djambi River), Moeara Laboeh, and Korintji by establishing railway connection between these places and a port on the east coast along the shortest and most economic route possible. In this case the most suitable ports to be considered first are the river ports of Koeala Tjenako or Pengalian, on the Indragiri River, which are always accessible for coasting vessels, and Tembilahan on the estuary of the Indragiri River, using Tembilahan, as soon as necessary, for an ocean port. Rengat, not always accessible for coasting vessels of 500 to 600 tons, is unsuitable as a regular port of shipment. The complete equipment of Tembilahan as an ocean port can not be justified from an economic viewpoint so long as it remains impracticable for rail connection with such excellent agricultural areas as Moeara Laboeh and Korintji.

Another important river port is to be found in Pakanbaroe, on the Siak River, which is always accessible for vessels of 600 tons. Pakanbaroe, however, is economically unsuitable as a port of shipment for the economic center of mid Sumatra in that a connection there *via* Taloek would necessarily increase the length of the Central Sumatra Railway to such an extent that it would not be possible for Moeara Laboeh and Korintji effectively to compete with the automobile traffic on the west coast of Sumatra.

Even for a connection later with a port of shipment, such as Soengei Paking, on the estuary of the Siak River, Pakanbaroe is unsuitable. The distance, 160 kilometers, is far too great and the districts to be traversed are not sufficiently fertile. From Koeala Tjienako or Pengalian to Tambilahan, in Indragiri, the distance is but 50 to 60 kilometers, and a fertile area will be traversed. Pakanbaroe, however, should be connected later when the work of construction of the longitudinal railway communication between the Kwantan district and the area situated north of it is undertaken.

This longitudinal communication, which should run from Pranap to Pakanbaroe *via* Taloek and Moeara Lemboe, with an extension *via* Bangkinang and Pasir Pengarajan to the Deli district, at present is not necessary, but later may be constructed in sections if funds are available, beginning, for instance, with the section Pranap-Taloek-Moeara Lemboe, abut 90 kilometers in length. This section of 90 kilometers runs through an economically developed area, where much is expected in the way of mineral resources and may afford communication later with the coal fields near Moeara Lemboe. This district, moreover, is orientated toward the Kwantan districts.

Any communication between central Sumatra and a second harbor (Pakan Baroe) thus at present is not a matter of urgency.

INDUSTRIAL

YAWATA IRON WORKS.—A new smelting furnace, yearly production of 500 kilo tons will be put in operation from the beginning of next year. With this increase of furnaces, it has decided to increase the coke furnace installations by a yearly capacity of 200,000 kilo tons. The estimated cost of construction is Y.3,000,000. It will be put in operation in 1931.

By this increase of the coke furnace, capacity of the coke production of the Iron works will be increased to some 1,400,000 kilo tons after two years.

NIPPON RAYON K.K.—The extension of the Uji Mill of the Nippon Rayon K.K. has been completed. There have installed eight Bobbin machines and 36 Centry Machines, totaling 44 new machines. The total daily capacity has been increased to six tons from three tons. The Uji Mill has been in operation at full capacity since August. By this extension, production of the company is increased to 18,000 bales for a half year term, which is double that before the extension.

MORE MACHINERY FOR SUNGSING MILL.—Complete installation of additional equipment will be made at the Sungsing Cotton Mill's No. 4 Plant at Hankow, it was announced this week, the equipment to consist of 10,000 spindles together with opening and picking machinery sufficient for 15,000 spindles.

The opening and picking machines are of the improved electric control type used in United States and have just been introduced here. They are used in preparing the baled cotton for the other processes through which it must pass before becoming yarn. The machines for the Sungsing mill are built to operate automatically, regulating the supply of cotton fed in.

The mill is owned by Mr. T. Y. Young. All the equipment will be supplied by Andersen, Meyer, & Co.

SHIPPING AND SHIPBUILDING

OGURA MARU.—The *Ogura Maru* has been launched from the Mitsubishi Dockyard at Nagasaki for the Ogura Sekiyu K.K. She is 430-ft. in length, has a beam of 57-ft. and a depth of 34-ft. 5-in., the gross register being 7,268 tons. A Sulzer engine built by the Mitsubishi Dockyard under licence will be installed, having six cylinders, 600 mm. bore, with a piston stroke of 1,060 mm. It develops 2,300 b.h.p. at 112 r.p.m. The *Ogura Maru* will carry petroleum in bulk.

MOTOR BOAT COAST SERVICES FLOURISH.—The remarkable invasion of motor bus services into the field of rural electric and other railway lines on land is being duplicated rapidly on water, particularly in the coastal, Inland Sea and Kishu services, where steamers are being displaced by motor boats, due to the same reason as on land. The proposed formation of a motor boat company, the Osaka Motor Boat Kabushiki Kaisha, is the outcome of measures planned by the O. S. K. interests to meet transportation competition in this respect.

The new company, with capitalization of Y.100,000, a quarter to be paid in on October 1, will have its organization meeting on October 17, when the company's officials will be appointed from O.S.K. officials and those of the Setsuyo Kisen Kaisha, an O.S.K. interest.

For initial operations, the company will charter a fleet of about 20 motor boats ranging from 50 to 60 tons, which will be placed immediately in freight service on the Kishu coast and also between Osaka and Kobe.

This is a preliminary project, it is reported. In accordance with the result capital and tonnage, including many new boats of the company's own, will be increased.

TWO 16½-KNOT JAPANESE CARGO LINERS.—Last April the Osaka Shosen Kaisha ordered four 16½-knot to 17-knot cargo liners of 10,400 tons deadweight capacity, with machinery of 7,200 b.h.p. The Kishimoto Kaisha K.K. has contracted for two vessels of practically the same size, 445-ft. long with a beam of 60-ft. 6-in. and a depth of 40-ft. 9-in., also to maintain 16½ knots loaded. In these vessels, however, M.A.N. machinery of about 7,200 b.h.p. will be installed. On completion they will be chartered to the Osaka Shosen Kaisha. They have no passenger accommodation. There is refrigerated space for about 300 tons of produce. The hulls will be built at Yokohama Dockyard.—*The Motor Ship.*

THE *SIAMESE PRINCE.*—The 10,000-ton motor ship *Siamese Prince* has been launched from the Blythswood Shipbuilding Co.'s yard. She is for the Prince Line and is 442-ft. long with a beam of 60-ft. and a depth of 27-ft. 7-in. Doxfordtype machinery constructed by Richardsons, Westgarth & Co. is to be installed, comprising two four-cylinder motors each developing 3,000 b.h.p. and running at 112 r.p.m. They have cylinders 600 mm. bore with a combined piston stroke of 1,800 mm. Three Diesel-driven generators of 135 kw. each are installed. The *Siamese Prince* will maintain a sea speed of 14½ knots when fully laden. Her usual voyage will be from New York, through the Panama Canal, across the Pacific, back through the Mediterranean, thence to New York, the total time occupied being from four to six months. Passenger accommodation is provided. A sister ship, the *Cingalese Prince*, built by the Blythswood Shipbuilding Co., ran trials on July 20.

NEW SWEDISH MOTORSHIP FOR FAR EAST TRADE.—The motorship *Shantung*, which has been built and engined by Gotaverken, Gothenburg, has carried out successful trials and been delivered to her owners, A.-B. Svenska Ostasiatiska Kompaniet Gothenburg. Intended for the owners' service between Northern Europe and the Far East, she is 435 feet in length between perpendiculars, 57 feet in moulded breadth, and 31 feet 6 inches in moulded depth from the main deck. The deadweight capacity is 10,100 tons on a draft of 27 feet. Four gas-tight 'tween-deck strong rooms intended for carrying calcium carbide, gunpowder, ferro-silicum, etc., are fitted. Each strong room has a hatch of its own. The propelling machinery consists of two six-cylinder four-stroke single-acting Gotaverken B. and W. oil engines of the long stroke, crosshead type, designed to develop a total of 4,500 i.h.p. at 100 revolutions. The cylinder bore is 630 m.m., and the piston stroke not less than 1,700 m.m.

A NOVEL SHIP FOR THE EAST ASIATIC CO.—The East Asiatic Co., Copenhagen, has a large programme of new tonnage in hand, involving the construction of new types of vessel and novel machinery installation. The first to be launched is the *Alsia*, building at the Nakskov Skibsvaerft, and she represents the biggest vessel constructed for the East Asiatic Co. to carry a large tonnage of cargo and a considerable number of passengers.

The length b.p. is 420-ft., the beam 57-ft. and the depth to the shelter deck 36-ft., the deadweight capacity being about 8,000 tons. She is to maintain 14 knots in service fully laden and will be placed on the Bangkok run. The machinery will be two 3,350 i.h.p. B. and W. four-stroke single-acting engines with six cylinders. On deck are 14 electric winches handling 15-ton derricks, and there are five hatches. Ten of the derricks will deal with 3-ton lifts, two with 5 tons and two with 7 tons. The electric winches, as well as the windlass and steering engine, are of the Thrige type.

The accommodation is on a luxurious scale for 48 first-class passengers. Each cabin has an adjoining bathroom, and on deck is a large dining saloon, the smoking-room and ladies' saloon, as well as a big entrance hall, being on the bridge deck.—*The Motor Ship.*

C. P. R.—Very complete gyro compass equipments have been ordered from the Sperry Gyroscope Company, Limited, London, by Canadian Pacific Steamships, Limited, for the new liners *Empress of Britain* and *Empress of Japan*. The installations embrace in the case of each ship, three repeaters and a course recorder, together with the Sperry compass attachment for the wireless direction finder.

DOLLAR LINE.—It is reported that recently Mr. A. M. Dollar, of the Dollar Line, has contracted with the Greenock Dockyard Company, Limited, Greenock, for a 13 knot steamer, of 9,400 tons deadweight. This vessel is to be 420 feet in length, and 58 feet in breadth, and as she is intended for the lumber trade will likely be a visitor to the Far East. She is to cost about £120,000, and is to be delivered in September, 1930. She will be owned by the Chief Line, of Vancouver, and will replace the *Chief Macquilla*, which was lost last winter.

A JAPANESE MOTOR CARGO AND PASSENGER SHIP.—One of two 9,500-ton motor passenger and cargo ships building at the Mitsubishi Dockyard to the order of the Osaka Shosen Kaisha has been launched. She is the *Buenos Aires Maru*, and is 460-ft. long b.p. with a beam of 62-ft. and a depth of 39-ft. 6-in. Cargo capacity is provided for 10,400 tons, and there is accommodation for 100 first-class and about 1,000 third-class passengers.

Sulzer-type machinery built in Japan by the Mitsubishi Dockyard Co. is to be installed, comprising two six-cylinder engines having a bore and stroke of 680 mm. and 1,200 mm. respectively. The propellers turn at 120 r.p.m. Both of these ships are for the Japan-American round-the-world service of the Osaka Shosen Kaisha, and it is anticipated that a trial-trip speed of 17 knots will be attained, the total output of the two engines when running at their normal speed being 6,400 b.h.p.—*The Motor Ship.*

NEW MAIL MOTOR VESSEL FOR DUTCH EAST INDIES.—Early in August the twin screw motor mail vessel *Johan van Oldenbarneveldt*, was launched from the slips of the Nederlandsche Scheepsbouw Maatschappy, of Amsterdam. The *Johan van Oldenbarneveldt*, built for account of the N. V. Stoomvavaart Maatschappy "Nederland," is the ninth mail ship which has been constructed by this shipbuilding company for these owners. The chief dimensions are:—Length 183 meters; breadth 22.73 meters; depth from D-Deck 14.42 meters. The vessel when carrying her full complement of passengers, will have 366 first class, 281 second class, 64 third class, and 60 fourth class, making a total of 771. The crew will number 344, bringing the total number of people aboard to 1,115. These figures are sufficient to demonstrate the size of this floating hotel, and it may be added that she is the biggest vessel ever launched at a Dutch yard. She will also be the most luxurious ship on the line to the Dutch East Indies. For the comfort of the first and second class passengers, besides the usual music rooms, smoking and dining saloons, there will be a special nursery with verandah for children. Two cabins de-luxe, with bathrooms, etc., four semi cabins de-luxe, one gentlemen's and four ladies' hairdressing saloons, shops, and a gymnasium are to be found in the first class quarters. She will also be the first mail vessel of the Company to have a swimming bath and an elevator for passenger communication between the various decks. The ship will be divided into ten water-tight compartments, and 16 life boats will be provided. Passengers will be kept fully advised of current events by the publication of a daily newspaper, printed on board and containing the latest wireless news. Sulzer-Diesel motors will give the vessel a speed of about 18 knots. The keel was laid on June 29, 1928, and the trials are expected to take place on March 15, 1930, enabling her to commence her maiden voyage to the Indies in May.

TELEPHONE, TELEGRAPH AND RADIO

THREE RADIO STATIONS BUILT IN KWANGSI.—A wireless system has been inaugurated in Kwangsi. The three stations installed at the most important cities of Kwangsi include one at Liuchow, an industrial district; one at Nanning, the capital of Kwangsi; one at Wuchow, an open port of the Province; and there is one to be erected at Lunchow, the thoroughfare of Kwangsi to Indo-China; one at Kweilin, and one each at Watlam and Jungyun.

LONG DISTANCE LINES PLANNED IN HEILUNGKIANG.—A network of long distance telephone lines is planned by the Construction Department of Heilungkiang. According to the scheme there will be lines totalling 4,030 li in length. They will extend as far as Nunkiang to the north, Tangyuan to the east. Tailai to the south, and Chalantun to the west.

The 10 lines are as follows:

1. The Tsi-Nun line between Tsitsihar and Nunkianghsien, over a distance of 480 li.

2. The Fu-Yah line between Fularchi and Chalantun over a distance of 448 li.

3. The An-Tang line between Antachan and Tangyuanhsien passing through Lansihsien, Hulan and Payenchow over a distance of 835 li.

4. The An-Lung line between Antachsien and Lungmenchun passing through Hailun over a distance of 1,239 li.

5. The Tsi-Ching line between Tsitsihar and Chingsingchun over a distance of 220 li.

6. Ang-Tai line between Anganchi and Tailaihsien over a distance of 150 li.

7. The Mei-Lai line between Meinkou and Tailaiting through Chaochow over a distance of 320 li.

8. The Pa-Ku line between Pachienhsien and Kushanhsien over a distance of 130 li.

9. The Pa-Yee line between Pachienhsien and Yeeanhsien over a distance of 115 li.

10. The Ling-Kao line between Lingtien and Siaosuntsechan over a distance of 100 li.

NEW TLS. 400,000 PHONE EXCHANGE FOR SHANGHAI.—Plans have been approved for the erection of a Tls. 400,000 exchange by the Shanghai Mutual Telephone Co., the work being scheduled to start early in October. The projected building will be six stories in height and in addition to an automatic exchange will also include a power plant, offices and headquarters for linemen, "trouble shooters," and other workmen covering the Central District.

The first floor above the ground will be used for the power plant and a battery room will also be placed on this floor.

The next floor will be given over to the automatic switchboard and it is planned eventually to equip a second switch room on the third floor. This story will be used for offices for the present, conditioning.

In addition to the exchange there will also be an air conditioning plant for the purpose of providing a constant temperature and humidity to insure the consistent operation of the switchboard apparatus.

The general contractor for the work will be Ah Hong & Co. Plumbing and heating equipment will be installed by the Shanghai Waterworks Fittings Co. Together with a Mather & Pratt sprinkler system.

The Crittall Manufacturing Co. will supply the steel casements used in the building while the electrical fittings will be installed by the Jardine Engineering Co. Pilkington Brothers will furnish the shop fronts. Scott, Harding & Co. will put in the lifts.

Architects for the building are Spence, Robinson & Partners.

PUBLIC WORKS

PHILIPPINE HYDRO PROJECT ON BOGOTAN RIVER.—Construction work is about to begin on the new hydro-electric development project to be made in the Philippine Islands. This water power project, which will have a head of 635 feet, is located on the Bogotan River about 50 miles from the city of Manila. Current will be transmitted over a steel tower transmission line at a voltage of 110,000, which will be the highest voltage in the entire Orient. The initial capacity will be 25,000 horse power and the equipment will be most modern, the waterwheel generators being rated at 720 revolutions per minute which will be the highest speed generators of that size ever built, the usual speed being 600 revolutions per minute. The power to be generated at this hydro will take care of the major portion of the electric requirements of the city of Manila and the adjacent and intervening territory and will be augmented by steam generated power at peak loads.

TIENTSIN HARBOR BUREAU.—The authorities of the Tientsin Harbor Bureau are considering the proposal to take advantage of the present scouring of the silt in the Haiho, to close the lock near Hsi Kai Ho in order to allow the water to flow straight into the Haiho, making the current more speedy. But, it is considered, this will not materialise until after at least one month after the present flood water has fallen to its normal level.

CANTON-HONAM BRIDGE.—The construction of a steel bridge from Canton to Honam Island across the Pearl River, in order to relieve the populated sections of the city, has for a long time occupied the attention of the Municipal Authorities. Plans and particulars of the proposed bridge have already been prepared.

Engineers and workmen have already been despatched to blast the submerged rocks in the river which the bridge will span. This blasting will at least take about a month, and the actual work on the bridge will start about three months thereafter.—*Canton News Agency.*

NEW SITE SUGGESTED FOR ANOTHER NORTH CHINA PORT: For some time past a surveying party has been engaged in mapping a survey of the whole of the Huai River valley, chiefly for the purpose of devising means of irrigating and the execution of other contemplated conservancy measures designed to ameliorate the flood conditions which from year to year afflict the population of that basin, sometimes to a very serious degree. This party has reported to the Huai River Conservancy Board that the mouth of the River Kuan, an offshoot of the Huai River, emptying itself into the Yellow Sea at a point below Haichow appears to be well adapted for the development of a harbor capable of accommodating vessels up to 4,000 tons. It is claimed, possibly with undue enthusiasm, that the suggested Huai River harbor would have natural facilities far surpassing those of the Hai-Ho and the Whangpoo, on which Tientsin and Shanghai, respectively, are situated, and that it can be developed without any too great expense for the government.

BUILDINGS

NEW TOKYO AND OSAKA HOTELS.—Construction of a hotel having about 400 rooms in Tokyo and another with about 500 rooms in Osaka, together with hotels of 30 to 40 rooms at various points in Japan is the plan now contemplated by the Railway Department and as to the building fund, negotiations are being held with the State Deposits Bureau through the Finance Department.

The tourist accommodation in this country is far too inadequate and in anticipation of foreign visitors' congestion at the forthcoming meeting of the World Engineering Congress at Tokyo and of the Institute of Pacific Relations at Kyoto, measures have been planned by the railway authorities, but as to the result, little is expected. In such circumstances it is impossible for Japan, it is contended, to attract foreigners, which has been urged as an important measure for improving the national trade balance. Thus the building plan has been submitted to the national trade balance commission by the railway authorities.

According to the plan, the places where new hotels are to be constructed include Tokyo, Osaka, Kyoto, Nagoya, Sendai, Beppu, Unzen, Nikko, Hakone, Miyajima, Kobe, Yokohama, Atami, etc. Financial accommodation for immediate requirements about Y.18,000,000, is being sought by the Railways from the Finance Department.

For a start, two structures will be built, one in Tokyo and the other in Osaka, when the plan is put into force, states Mr. Hiasa, chief of the passenger section of the Railway Department and the approximate cost will be about. Y.15,000 per room.

MODEL HOUSING IN MACAO: The Portuguese authorities at Macao are to be congratulated on the steps they are taking to secure better housing for the poorer classes of the inhabitants of the southern city. Almost a year ago a fire destroyed the matshed homes of thousands of Macao's poorer inhabitants. On the site so wasted there are now series of solidly built brick erections, clean and comfortable, a decided advance on the hovels that were there before. This transformation has been brought about by the attitude of the Portuguese Government, which handed over the sites for the houses, raised the level of the land by several feet, provided suitable drainage and gave $40,000 to a fund raised for the purpose of building the new homes. Other contributions were obtained from various sources with the result that what was formerly a municipal eyesore is now a remarkable proof of its ability to erect houses capable of accommodating the poorest of poor classes.

ROADS

HANGCHOW-NANKING HIGHWAY.—The Chekiang section of the Hangchow-Nanking motor highway has been completed as far as Huchow, an important silk producing city in this part of China. This road starts from Hangchow and passes through Yuhang, Pinyao and Wukan. The first section from Chentsan of Hangchow to Sanchiaobu of Wukang is 114 li in distance. From there it branches to Mokanshan over a distance of 12 li. The new section begins at Sanchiaobu and ends at Huchow outside of the city. The distance is 80 li.

From Huchow on the road will be further extended to Changhsin over a distance of 80 li. In fact that section is nearly completed and it will be opened for traffic as soon as the bridge now being built at Huchow is finished. The work is very far advanced and is expected to be finished within the next month. It has three spans of steel and two piers of massive concrete construction.

A long distance bus line was inaugurated on October 1 on this road and stations are being erected along the route.

The work on these roads are being carried out by a group of Chinese civil engineers who have been able to maintain a good standard. With a backing of $3,000,000 a year from the provincial treasury, present indications point to a rather promising future.

ROAD SCHEMES FOR KIANGSU: The Kiangsu Provincial Government at Chinkiang, through its Provincial Capital Reconstruction Commission, is preparing for the fuller development of the province by laying out a scheme for the building of new roads throughout the province. The scheme, full details of which have not yet been published, is, we are informed, a most comprehensive one and should do much to open up the country districts. In the city of Chinkiang the project provides for the construction of a number of modern streets with sidewalks, along approved foreign lines, first, to open up the city itself, and secondly, to provide routes for the electric tramcars which it is hoped to operate later in the newly fashioned city. A preliminary grant of $300,000 has been suggested for the purpose of taking the schemes further, and this suggestion has been forwarded by the Commissioner to fhe Provincial Government for its sanction.

AVIATION

SHANGHAI-HANKOW AIR MAIL: The early part of last month saw further pioneer work in the matter of extending China's air communications, when the first test flight was undertaken from Shanghai to Hankow and back. The trip, one way took somewhat over six hours, a time which can be shortened by adopting a more direct route in the future, it was stated. The flight was made by the Huyung No. 2, with a foreign pilot on board. It set out from Shanghai and called in at Nanking, eventually hopping off from there and reaching Hankow six and a half hours after leaving the first named port. The trip was a complete success and it is expected that in a short while arrangements will be perfected for opening a service direct with the up-river city, using foreign pilots for the work, while the Chinese pilots who have been in training on the Shanghai-Nanking service will be placed definitely on that run. While on the subject of aeroplanes it is interesting to note that two of the six passenger carrying aeroplanes ordered from America by the Chinese Government arrived early last month. They were assembled on the Dollar Wharf, where they were landed and eventually taken over to the Kiangnan Arsenal. Each machine, which is painted blue in front with wings and tail of silver grey, is capable of carrying six passengers and two pilots, and represent the first larger development in the air services of China since their inception which was only a few months ago. The Chinese are showing a most praiseworthy enthusiasm in the matter of aviation, and it is to be hoped that their efforts in this direction will be crowned with substantial success.

OSAKA-SHANGHAI AIRMAIL.—Aerial passenger service between Osaka and Shanghai will be inaugurated shortly by the Japan Aerial Transportation Company, it is reported in local Japanese papers. The trial flight between the two places will be made soon.

CALCUTTA-SINGAPORE AIR ROUTE.—Mr. G. E. Livock, Commander of R.A.F. flying boat which upon arrival at Calcutta, interviewed said that flying from Rangoon, except during the monsoon, presented no unusual difficulty. It was often more pleasant than traveling by ship. Mr. Livock said that the flights were Royal Air Force exercises carried out to obtain an accurate data, of weather condition along the Calcutta-Singapore route *via* Rangoon. The data obtained from the flights would be available for any Air Company serving the air route for any purpose. The flights were not being carried out with any immediate commercial aim in view.